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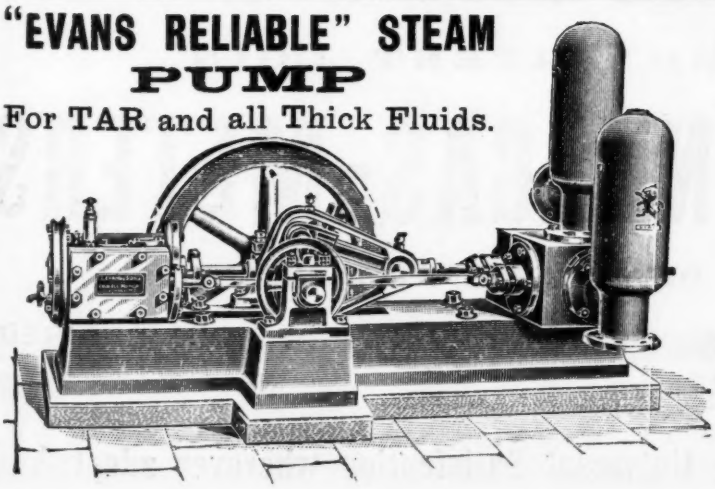

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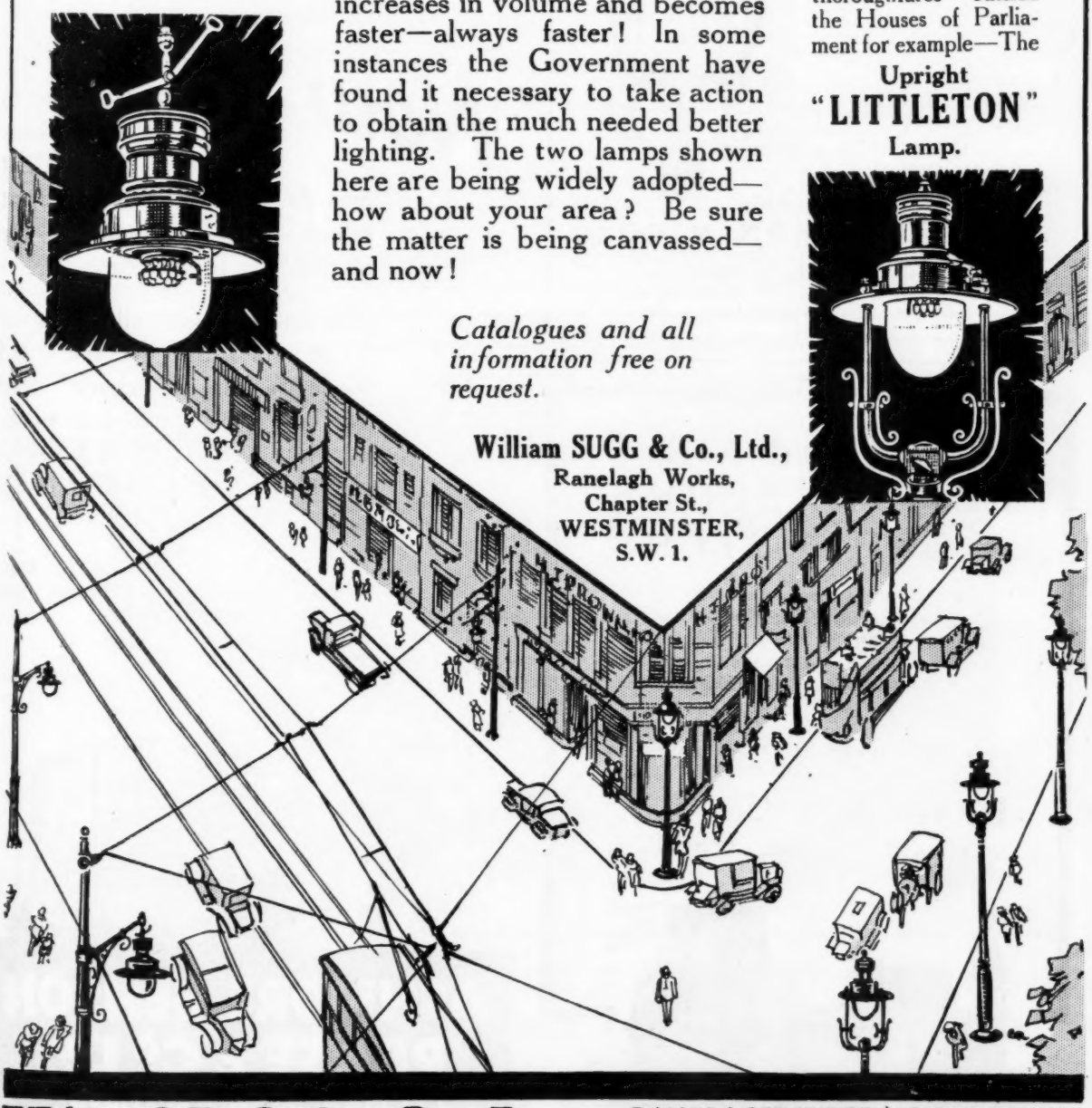

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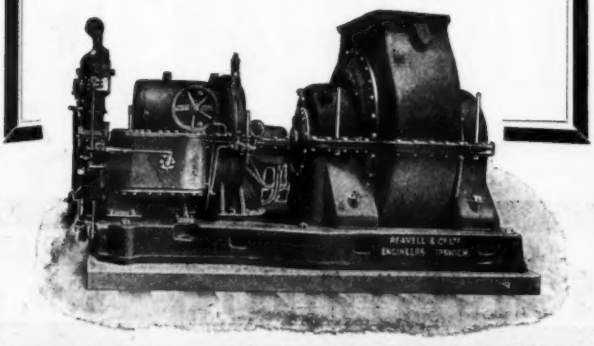

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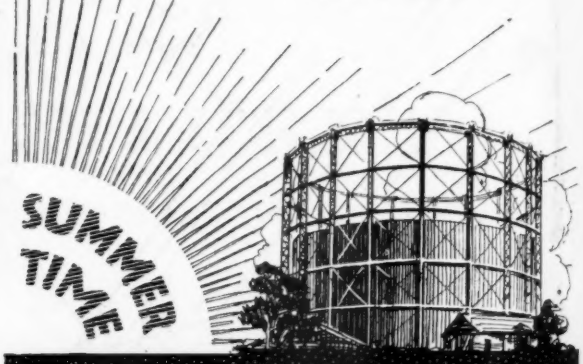

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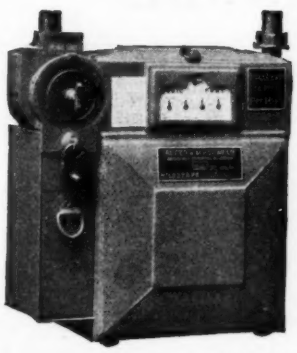

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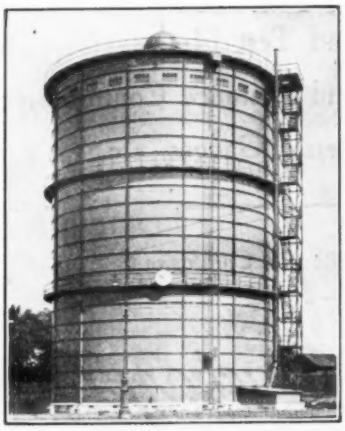

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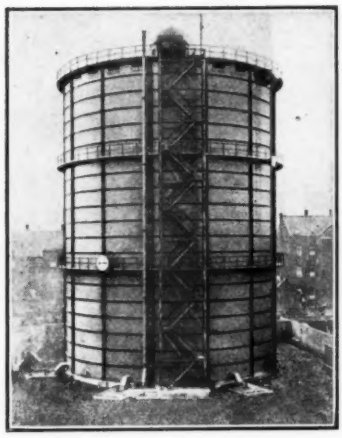

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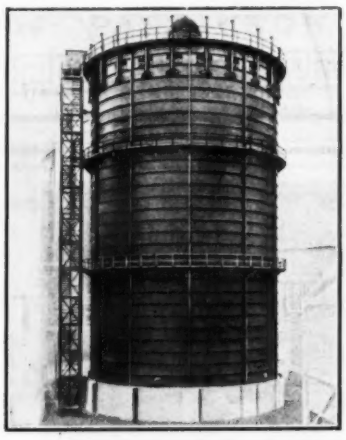

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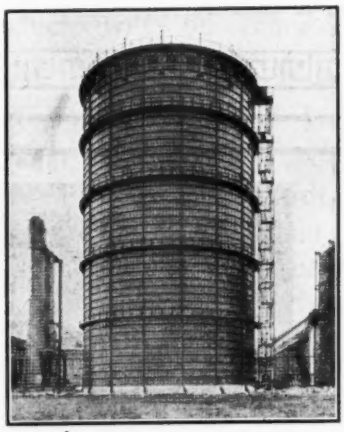

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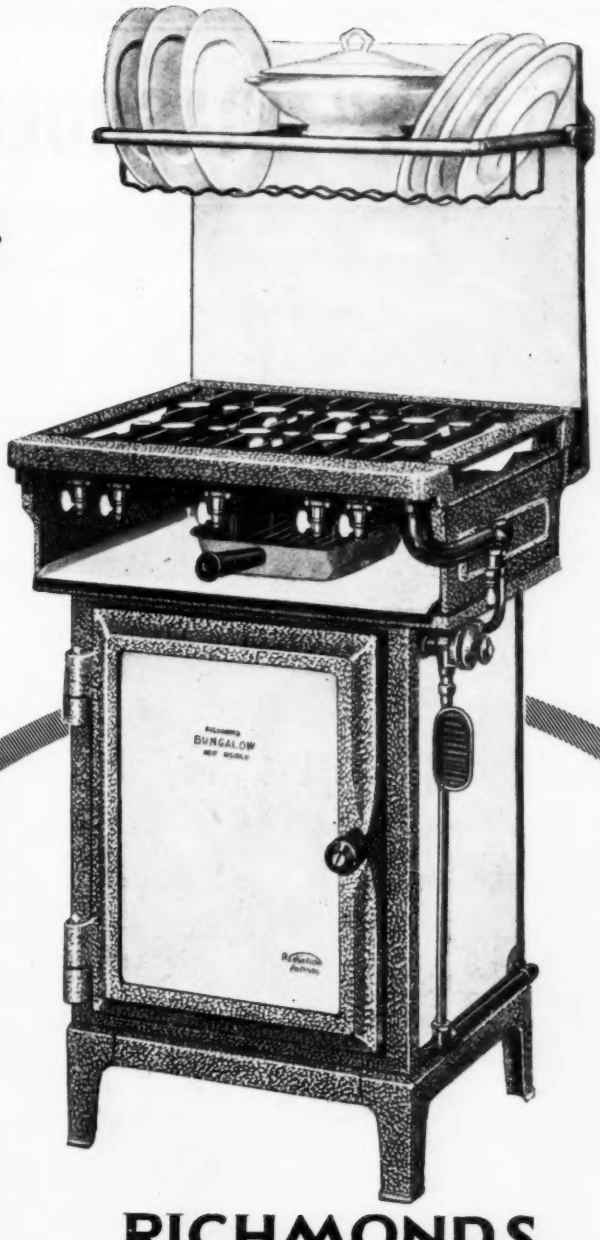

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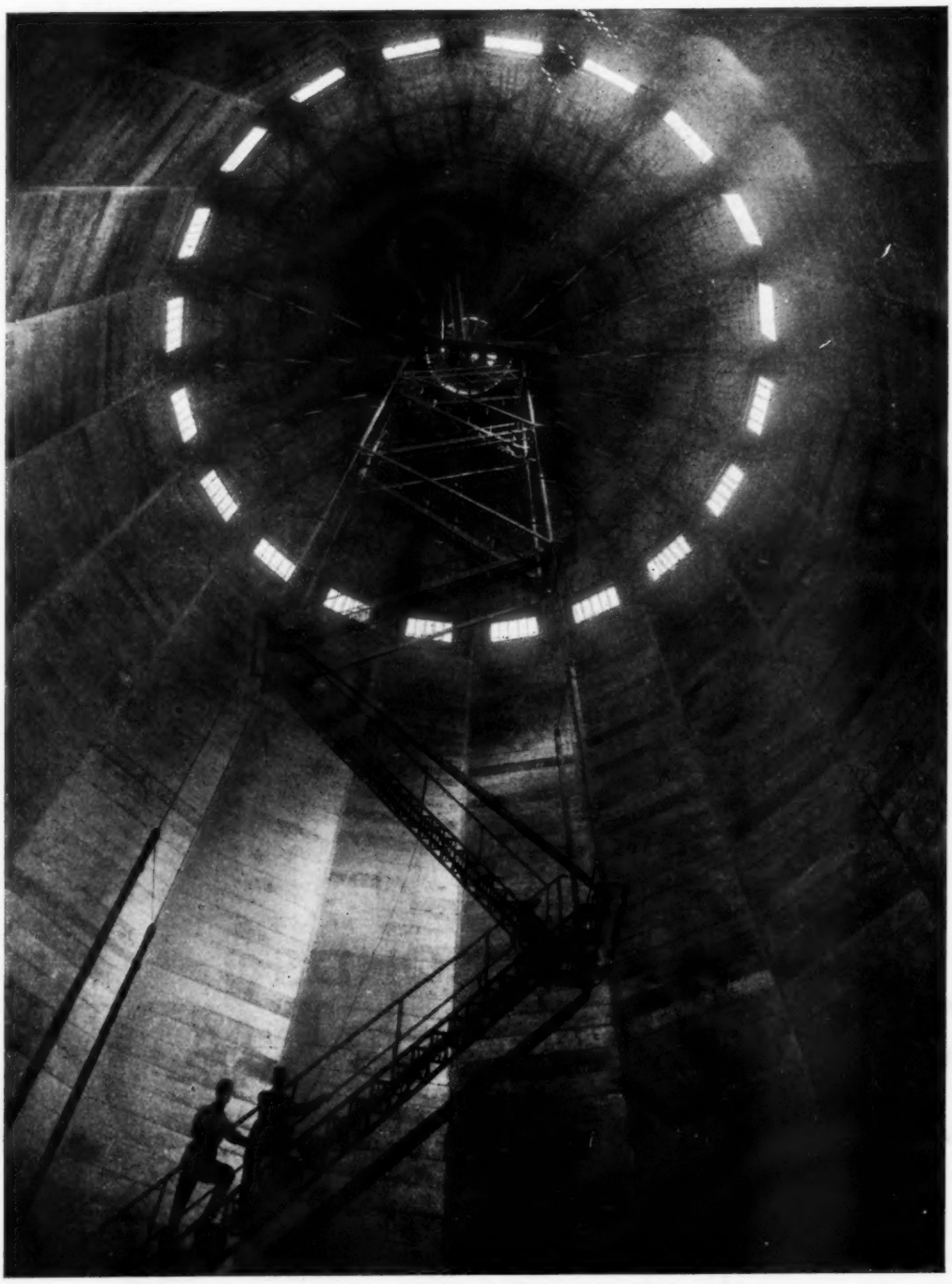

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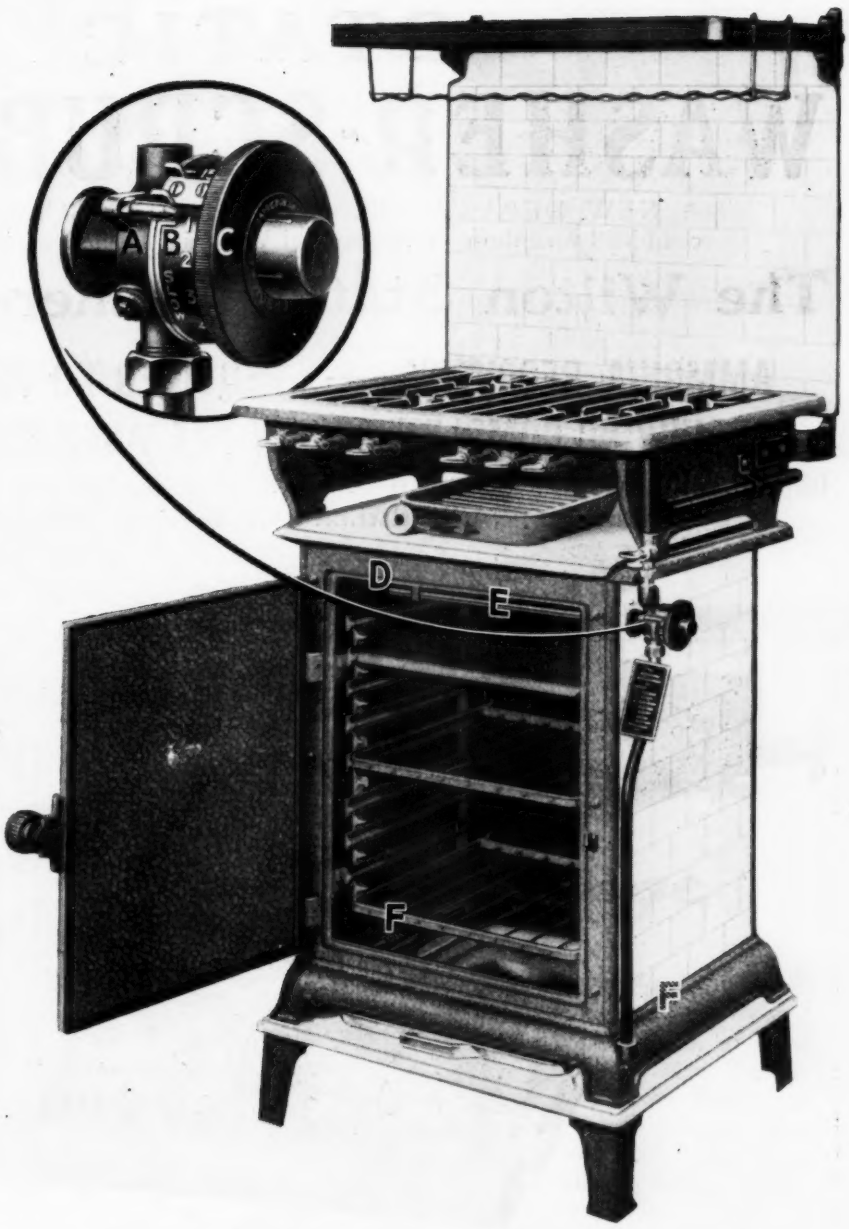

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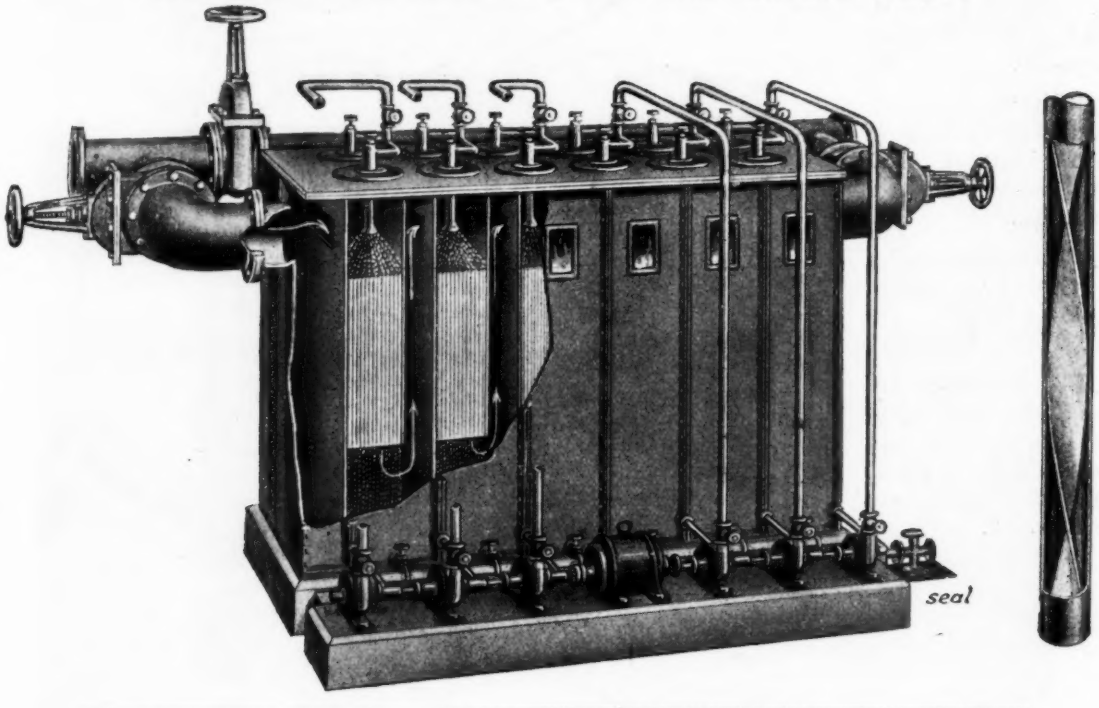

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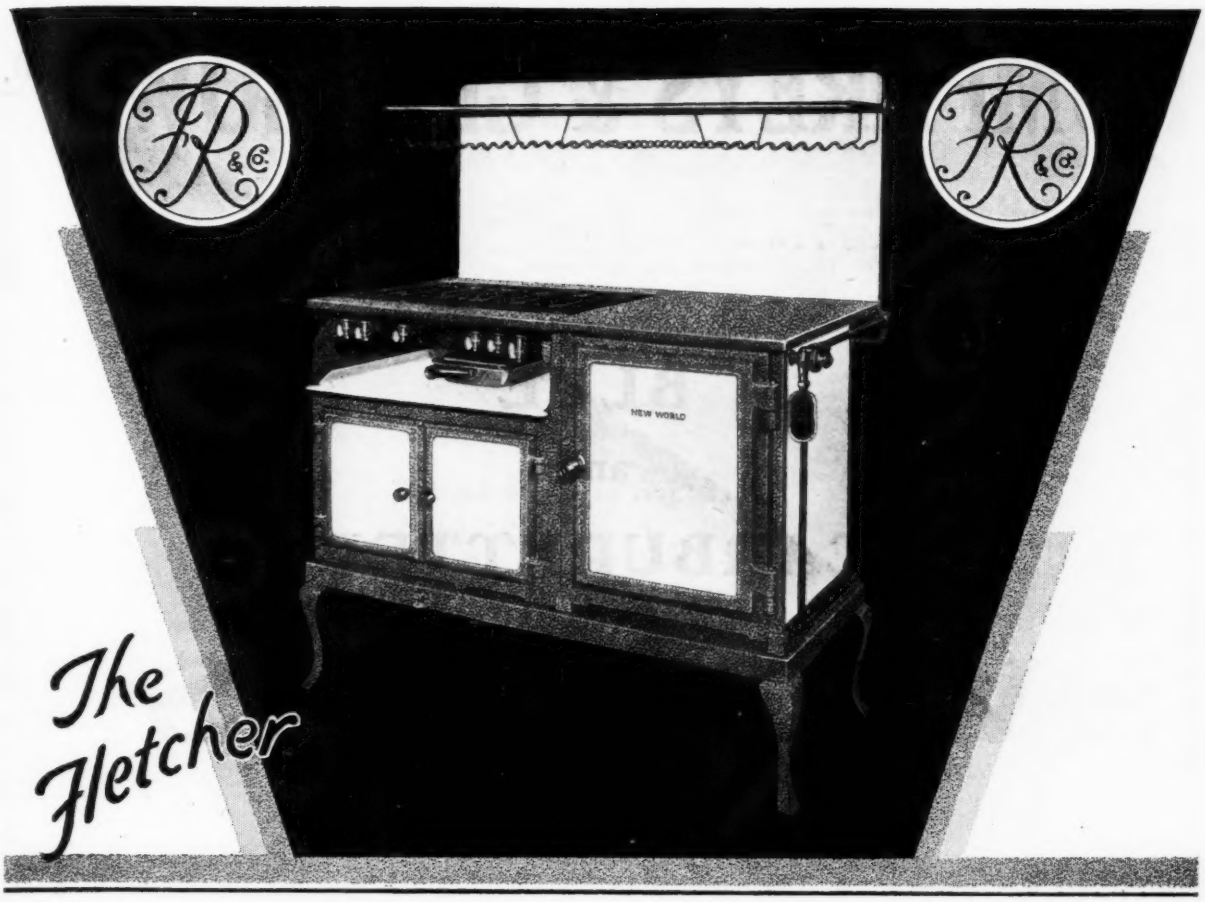

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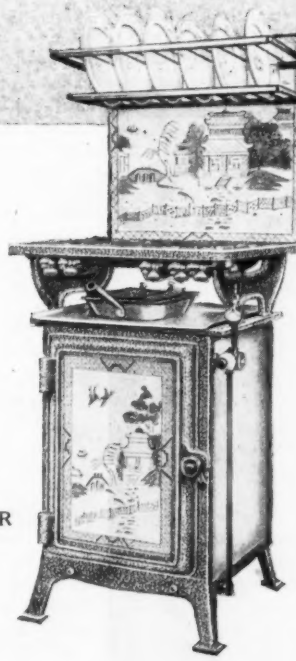

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VOL. CXC. No. 3493.] WEDNESDAY, APRIL 30, 1930. [82ND YEAR.

Editorial Notes.

The Institution Meeting in Leeds.

THE full programme of what promises to be a thoroughly successful meeting, from both technical and social aspects, is published to-day in later columns. The arrangements are singularly attractive, and praise ought certainly to be given to the President, Mr. C. S. Shapley, for introducing innovations which are bound to be exceedingly popular. Leeds is an admirable place for a meeting of this kind. It has, of course, a well-merited reputation for sincere hospitality; apart entirely from this, however, it is more than fitting that the Institution should visit the headquarters of their research organization—the University of Leeds. Presentation and discussion of the Reports of the Joint Investigation Committee of the Institution and Leeds University, and of the Gas Fellowship Report, will be made at the Autumn Meeting of the Institution in London in November next, and this plan, which is also due to Mr. Shapley, has everything to commend it. There will now be plenty of opportunity for discussion of the papers, which hold wide interest and deal with current problems, at the Leeds meeting. In addition to obviating the erstwhile five-o'clock scramble through technical work of great significance, this wise arrangement will have the dual effect of leavening the entire business proceedings with well-planned visits for the members participating in the conference. Also, the ladies are to be treated in Yorkshire fashion, right royally. For every day of the meeting some social event has been organized, without taking into account the customary, and always delightful, reception given by the President and his wife. Therefore, as each day passes, to the satisfaction of the men will be added the satisfaction of the ladies; and, without computing this accelerating pleasure in mathematical terms, we are sure that the 1930 Annual Meeting of the Institution will be admirable in every respect.

Gas at the World Power Conference.

IN a few weeks' time statesmen, scientists, technologists, and industrialists will appear in Berlin on the stage of the Second Plenary Meeting of the World Power Conference. The stage is set at the Kroll Opera House, and June 16 will see the beginning of a ten-day programme of extreme interest and wide and far-reaching significance. We understand that about three hundred British delegates hope to be present at the conference, that a similar contingent is expected from the United States, and that German and other national representation will swell the total to something between three and four thousand. We mention these figures as affording some indication of the growth of the international idea in regard to power problems. Six years have elapsed since the first meeting was held at Wembley, at the time of the British Empire Exhibition, when rather fewer than a thousand members participated in the proceedings. In the intervening period, the sectional conferences in Basle, London, Barcelona, and Tokyo have added to the strength and enhanced the value of these very necessary international discussions.

Also in the intervening period it has been recognized that technical progress in the power industries has been greater than what may be termed the economic progress; and in Berlin the financial factor will be considered broadly and closely, and political and trade agreements will be discussed. From the gas point of view, the Berlin meeting will unquestionably be a great advance on the Wembley conference, on which occasion gas played a minor rôle in the programme. In Germany, however, solid, liquid, and gaseous fuel is regarded as at least of equal importance to electrical energy, and in both the contributions and the visits gas will occupy a star part. Already we have given our readers a list of the papers which immediately concern the gas industry, the study of which no one responsible for the progress of gas can afford to neglect. In regard to the British authors, such names as R. Lessing, E. C. Evans, Michael Barash, Stephen Lacey, James Wood and Gilbert Howarth, Allan Monkhouse, C. H. Lander, Harold Hollings, T. P. Ridley, and F. W. Goodenough—we have selected these names purely at random—are in themselves sufficient recommendation of the importance and the worth of their contributions; and we are glad indeed to know that the gas salesman is at long last coming into his own at an international gathering of the highest class. We refer to the paper by Mr. E. A. Leask, on "The Methods of Encouraging the Use of Gas in Industry." Mr. Leask, as readers of the "Gas Salesman" will know, is a past-Chairman of the West Riding of Yorkshire Gas Salesmen's Circle. Practically every important current gas problem will be discussed; and opinions on such questions as methods of charging for gas, and combined control of gas and electricity supply, will be ventilated.

There is, in brief, every indication that the Berlin conference will benefit the cause of gas throughout the world. Regarding the meeting more generally, we may mention that the papers themselves number more than four hundred, and represent contributions from each of the forty-eight countries who are members of the conference. Great Britain alone has contributed about fifty papers, sponsored by the leading technical organizations and associations of this country. The work which this has

entailed, and the manner in which it has been carried through, reflect no little credit on the British National Committee. The Chairman of this Committee is Mr. D. N. Dunlop, and the Secretary Mr. C. Rodgers; and we record for the interest of our readers that the membership includes Sir David Milne-Watson, Sir Dugald Clerk, Mr. C. F. Botley, Dr. H. G. Colman, Mr. G. A. Hebden, Dr. C. H. Lander, Mr. R. J. Milbourne, and Dr. E. W. Smith.

The Berlin conference has at least a twofold appeal. Primarily there are the series of main lectures on very broad problems, and the specialized contributions on particular phases of these problems; and, secondly, there are the proffered bounteous hospitality and the splendidly arranged visits to works and places of historical interest. At the conclusion of the conference, facilities are being granted for inspecting the most important power and industrial plants in Germany, the number of such plants which can be visited in this connection numbering over two hundred. These include gas-works, coking installations, and long-distance gas supply plants, and doubtless many of our readers would enjoy visiting some of the technical universities and institutions in a country world-famed for its scientific scholarship and industrial technology. The World Power Conference of 1930 is going to be a wonderful meeting.

Character.

Many who read these lines will recall a day at Wembley—it was at the close of September in 1925—when salesmen from all parts of the country had assembled for their annual gathering, and when the chief item of business was an address by Mr. Angus Watson, J.P., Chairman of Messrs. Angus Watson & Co., Ltd. It was a memorable occasion; but, alas, in these strenuous times the human brain is incapable of memorizing everything that should be remembered, and from that point of view the printed record becomes of much increased value. Happily, complete reports of the proceedings at all of the annual Salesmen's Days are preserved in the volumes of the "Gas Salesman;" and no one feeling need for inspiration, encouragement, or guidance could do better than refresh his memory by a re-perusal of these reports. It has been the custom at the yearly gatherings of the salesmen to invite assistance, in the form of an address, from someone prominent on the selling side of industry, and only a week or two ago there was a notable example of this in the address delivered on Salesmen's Day by Mr. Frank W. Moore.

Study of the experiences, the opinions, and the advice of such well-known business men must convince the salesman that he has chosen a career in which character, and therefore principle, must play a vital part; and it is just this reflection that induces us now to turn back to the October, 1925, issue of the "Gas Salesman," containing Mr. Angus Watson's address on "The Ethics of Salesmanship." The address revealed the man, in addition to revealing the importance of salesmanship. "I think," said Mr. Watson, "the School of Salesmanship is without any doubt the best training that a man can have for a business career, for it calls out in the fullest measure all the resources of a capable business man." Mr. Watson is himself a striking example of this; and others equally convincing could be cited. In the address to which we refer, Mr. Watson discussed the qualities that a salesman needs to cultivate if he is to be successful in his work; and as being certainly the first and the most important, he named character. Indeed, he told his audience quite plainly that, as the result of twenty years' experience "on the road" in this country and in the United States, he had no hesitation at all in saying that, no matter how brilliant a salesman might be, unless behind all his other qualities was that of straightness, he would not eventually succeed.

We all of us carry in our minds what is meant by "character," but it is nevertheless a difficult quality to define. Mr. Watson himself suggested as a final test of character the application of the golden rule which "lays it down that you will not do to another man what you would not be prepared to accept from him in like circumstances."

Principles.

Only a high-principled man, then, can possess "character;" and only a man who remains steadfast to those principles can retain "character." Mr. Angus Watson both was and is a man of character; and a recently announced determination of his demonstrates that he will on no consideration sacrifice his high ideals. He has been Chairman of Associated Canners, as well as of Angus Watson & Co., and general regret has been caused by his resignation of both Chairmanships, as from June 30 next. The reason stated when the resignation was announced was that a vital issue had arisen between shareholders of Associated Canners and himself regarding the future policy of the Company. Mr. Watson, indeed, had placed principle first, and, though with deep regret, had decided to remain true to himself and to the convictions that have lived with him throughout a lifetime.

And what is this principle for which Mr. Angus Watson has sacrificed so much? It is in any case an important one—he himself regards it as vital. What he is contending for is the preservation, as far as possible, of the human element in business. To use his own words, his attitude is "virtually a plea for the humanitarian interpretation of business, rather than the mechanization of it." The personal touch gives to commerce and industry just that interest which is essential to the highest performance of duty, and which modern methods have too often done much to weaken. There will be a general desire to congratulate Mr. Watson upon the stand he has made. Far-seeing administrators have long recognized the importance of encouraging the individual worker to give of his best, and have perceived the possible disadvantages from this point of view of present-day tendencies. The gas industry has in many cases been extremely active in support of the personal touch, by cultivating the social side, by putting in operation welfare schemes, and by establishing co-partnership; and we should like to see these efforts still further intensified, rather than that there should be any falling off. As the move towards—shall we say?—mechanization becomes more pronounced, so does the need for cultivating the personal touch become greater. Fixed scales of advancement, pension schemes, and any other systems which are calculated to dim the haunting shadow of fear for the future, are big steps in the right direction.

The personal touch, however, is—like certain much advertised commodities—"something different." It is of first importance now; we foresee that it may become of still greater importance in the future. Therefore no opportunity should be lost of retaining it, or better still of increasing it.

Confidence.

Writing of qualities, too, brings to mind last week's meeting of the Bombay Gas Company, Ltd., which is fully reported on later pages of this issue of the "Journal." The results of the working for the past year were highly gratifying, and more particularly so when taken in conjunction with the somewhat difficult conditions that of late have ruled in India. These difficulties have become intensified of recent weeks, but we look forward with much assurance to the return of more settled times long before the Board of the Bombay Gas Company are called upon again to render an account of their stewardship. To this end many things are doubtless required; and the question cannot be fully discussed without—as we have no intention of doing—touching upon politics. An infallible method of assisting was, however, pointed out by Mr. W. G. Bradshaw, C.B.E., the Chairman of the Company, when he read a statement made by the President at the annual meeting of the Bombay Chamber of Commerce. With regard to India, the President said, one thing is obvious—"that confidence and stability are required, and no one is doing anything to better the situation, whether it is in the realm of politics or commerce or finance, by doing or saying things which impair confidence, whether it is our own confidence in ourselves or other people's confidence in us."

This is a statesmanlike remark, and draws attention to yet another quality which possesses virtues the world

over, in salesmen and in all others. The confidence which is necessary in India can be equally helpful elsewhere—to the individual who cultivates it, and to the industry with which he may be concerned. Therefore, to the desirable qualities of character and high principles, let us add confidence, both in ourselves and in our industry. But this confidence must not be confused with complacency, self-satisfaction, or cock-sureness, from all of which it is far removed.

Working Testimony.

We have yet to encounter any adverse criticism of the Holmes process of gas dehydration; and considering that the first plant on this system, at Taunton, has now been in operation for four years, and that works of all capacities ranging from 250,000 c.ft. to 20 million c.ft. daily are now distributing dehydrated gas, this is remarkable testimony to the efficacy of the process and to the efficiency and adaptability of the plant. A further record of success is outlined in our columns to-day by Mr. J. T. Spencer, of the Weston-super-Mare Gas Company, who dealt with the subject in his Presidential Address to the Western Junior Gas Association last Saturday.

The "Dri-Gas" plant at Weston, which, installed in January, 1927, has been working since August of that year, has a capacity of 2½ million c.ft. per diem, and has demonstrated a most gratifying capacity for reducing main and service complaints. The average number of such complaints during the period 1925-27 was 2230 per annum (263 per 1000 consumers); last year the figure was 212 (22 per 1000 consumers). Mr. Spencer mentions that, during the phenomenally cold weather of February, 1929, only four house services and nine lamp services were stopped-up, as a result of water or frost, out of a total of 8400 services. This great improvement has been accompanied by a marked diminution in the number of meters passing unregistered gas; and it would appear from Mr. Spencer's observations that time will show that dry gas has a beneficial effect on the general condition of meters.

As at Taunton, the main holders at Weston-super-Mare are timber framed, and a considerable degree of resaturation of the gas resulted first from the partial drying-out of the large quantity of exposed and saturated woodwork, and, secondly, from capillary action of the wooden posts. In such circumstances it is a nice point whether the drying plant should be placed at the inlet to the holder or at the outlet to the district, though Mr. Spencer, calling attention to the facts that dry gas entering the holder minimizes corrosion of the internal framing and sheets, and that a plant at the outlet to the district involves loss of pressure, emphasizes the advantages of drying the gas before it enters the holder. Where possible, there is no doubt that this is the best course to follow. Adoption of the waterless gasholder eliminates any argument about the question; but with ordinary tank holders, it has been shown that the outlet of the holder is in certain cases as efficient a position for the drying plant, in spite of a heavy peak load, since the small rise in moisture content through the holder, due partly to diffusion of water through the oil film, is avoided. Naturally there is a strong inducement to place the plant at the holder inlet, for, in addition to the points mentioned above, the rate of input to the plant is fairly constant, and the cost, therefore, is cut down as compared with that of a plant positioned at the holder outlet. On the other hand, it ought to be emphasized that the back-pressure which, as mentioned by Mr. Spencer, is set up by the latter arrangement is by no means enormous. At the annual convention of the American Gas Association last year, Mr. C. Cooper referred to an instance where the resistance to gas flow through the absorber is kept as low as one and a half tenths of an inch.

Of very great interest in Mr. Spencer's address are his figures relating to unaccounted-for gas, and his remarks on rust deposits. The total quantity of unaccounted-for gas is now no more than it was in 1916, notwithstanding an increased output of 61 p.ct. When gas drying was commenced, an increase in leakage was anticipated; actually the percentage has decreased. And trouble from dry rust has not materialized to any important extent.

World Power Conference, 1930.

As mentioned in previous columns, the Second Plenary Meeting of the World Power Conference will be held in Berlin from June 16 to 25. We learn that applications for membership should be made not later than June 1. Gas problems enjoy a major rôle in the programme of the conference.

Roads Must be Adequately Lighted.

The necessity for more adequate street lighting has been stressed time and again in these columns, but always with the fear that, appearing where they do, the remarks may be regarded in some quarters as being biased. In reality, of course, it is largely the fact that we have given so much attention to the subject of outdoor illumination which enables us to realize how much better can be done in this respect in many situations than is being done at present. Confirmation of the view that there is this need for improvement is welcome wherever found, and we have been pleased to note in the newspaper Press a letter from Miss Violette Cordery, of Fairmile, Cobham—a lady who has achieved fame on the track at Brooklands—in which, after pointing out that it is high time something was done to improve the illumination especially of our main roads, she expresses her pleasant surprise at having observed recently that on the outskirts of London one of the local Borough Councils had really tried to tackle the question seriously.

The Part that Gas Can Play.

What Miss Cordery is referring to, of course, is the experiment described fully in the "Journal" for March 26 and April 2, which has been undertaken at Lewisham, where one mile of road was lit with gas and the next mile with electric light, so that one could drive along the whole length and judge for oneself which is the better. This is what she has to say of the experiment: "Personally, I have no doubt whatever, after studying the Lewisham lighting, that of the two installations I saw there, the gas lamps are much the more effective. Frankly, I did not like the electric lamps placed at the sides of the road. They left troublesome black spots all over the place, and I felt uncertain of myself all the time. The gas lamps were hung right in the middle of the road; and they had a delightful open light which gave one complete confidence, as one saw a clear run for a long distance ahead, with no shadowy patches. If electric light can give the same effect under some different system than the one at Lewisham (and I don't see why it shouldn't), we should then know that there was no excuse for badly-lit main roads in any part of the country. In any case, we should have the best lighting we can get at a reasonable cost, and if, as at Lewisham, gas is superior, there seems no reason why it should not be widely adopted."

Popularizing Electricity.

A good deal is heard nowadays of assisted wiring, or fitting-up on hire-purchase, as a means of extending the use of electricity among the less wealthy portion of the community. Edinburgh has had under contemplation this method of encouraging people in the poorer localities of the city to take current, and the Electrical Engineer has submitted a report in which he suggests that three lights shall be the minimum, that the scheme shall apply to residential property only where mains are available, and not to houses under construction or to houses over £50 assessed rental, and that the basis of charge to the consumer should be the net cost of the installation, *plus* 10 p.ct. to cover the Corporation for financing the scheme. The consumer to pay 25 p.ct. of the total cost before the supply is connected, and the balance of 75 p.ct. in nine term periods.

Laying Pipe Across the Mississippi.

Crossing the Mississippi River was perhaps the most spectacular as well as difficult feat accomplished in building the new $25,000,000 distributing system for the Southern National Gas Corporation, writes Mr. George H. Watson in the "Gas Age-Record." Two months were required to get ready for this job, though the actual work was carried out in only eleven days. Multiple lines were used as a precaution against interrup-

tion of service. As the 22-in. main nears the river it is divided into two 16-in. lines; provision is also made for a third line. At the edge of the river another header divides each of the two 16-in. lines into three 10¾-in. mains. These six mains extend for a distance of about 3000 ft. across the river.

Personal.

Mr. W. H. Mainwaring, who retired recently from the position of Lincoln Corporation Gas Manager, received a presentation at the Bracebridge Gas-Works, Lincoln, on April 17. Among those present were the Mayor of Lincoln (Councillor T. Nowell), Councillor A. L. Bower (Chairman of the Gas Committee), Mr. George Wright (Mr. Wainwaring's successor), Mr. O. Fox (Chief Clerk), Mr. George Twist (Distribution Superintendent), and members of the staff. Mr. Mainwaring was given a mahogany sectional bookcase. Mr. Twist paid high tribute to Mr. Mainwaring's ability as a manager and the good work that he had done for the Department during a very difficult period in its history. Mr. Fox made the presentation on behalf of the staff and workmen of the Gas Department. Mr. Mainwaring, acknowledging the gift, said that there was something very fitting in the fact that the presentation should take place at Bracebridge, for in the building in which they were assembled that afternoon, his career with the City Gas Department commenced 47 years ago. The Mayor expressed the appreciation of the Council of the good work that Mr. Mainwaring had done for the Department. He said he and Mr. Mainwaring had been friends for many years, and he hoped that friendship would continue.

In "The Times" for April 24 the engagement was announced between Kenneth Newsom Davis, eldest son of Mr. and Mrs. Newsom Davis, of Harpenden Common, Hertfordshire, and Eileen, eldest daughter of Major-General Godfrey Tate, K.H.S., I.M.S., and Mrs. Tate, of 64, Wildwood Road, Golders Green, N.W. 11.

Mr. Charles Robert Ingham, for the past seven years Manager of the Brighouse Corporation Gas Undertaking, was married on Easter Tuesday, at Brighouse Parish Church, to Miss Muriel Irene Bottomley, elder daughter of Mr. W. A. Bottomley and the late Mrs. Bottomley, of Hillside, Brighouse. Among the wedding presents were a handsome sectional bookcase, given by the members of the Brighouse Corporation Gas Committee; and a timepiece and tea-tray, the gift of the staff and employees at the gas-works.

Forthcoming Engagements.

[*Secretaries of Gas and Kindred Organizations are asked to assist in making this diary of events as complete and useful as possible by sending the earliest intimation of all meetings.*]

May 2.—North of England Gas Managers' Association.—Annual General Meeting in Newcastle.
May 2.—British Commercial Gas Association.—Scottish District Conference, Ayr.
May 2.—London and Southern District Junior Gas Association.—Annual Meeting, Westminster Technical Institute, S.W. 1.
May 3.—Scottish Junior Gas Association (Eastern District).—Annual General Meeting, Edinburgh. Address by E. W. L. Nicol, Assoc.Inst.C.E.
May 7.—Manchester and District Junior Gas Association.—Visit to Manchester Docks (Manchester Ship Canal Company) and to the Partington Gas-Works.
May 9.—Southern Association of Gas Engineers and Managers.—Visit to Eastbourne.
May 9.—British Commercial Gas Association.—Midlands District Conference, Malvern.
May 13.—British Commercial Gas Association.—Executive Committee Meeting, London, 2.30 p.m.
May 15.—Midland Junior Gas Association.—Annual Meeting, Council House, Birmingham.
May 15.—Midland Association of Gas Engineers and Managers.—Spring general meeting at Bromsgrove.
May 16.—Eastern Counties Gas Managers' Association.—Spring Meeting at Harwich.
May 16.—Society of British Gas Industries.—Council meeting in the morning.
May 16.—Society of British Gas Industries.—Annual General Meeting and Dinner, Hotel Metropole, London.
May 17.—Yorkshire Junior Gas Association.—Visit to Messrs. Stainsby & Lyon, Ltd., Tar Distillers, Knottingley. Paper by Mr. Billbrough on "Tar Distillation." Also a visit to Messrs. Bagley & Co., Glass Works.
May 21.—Wales and Monmouthshire Institution of Gas Engineers and Managers.—Meeting at Caerphilly.
May 21.—British Commercial Gas Association.—General Committee Meeting, London, 2.30 p.m.
May 23.—British Commercial Gas Association.—Lancashire District Conference, Morecambe.
May 27.—National Gas Council.—Annual Meeting.
June 2-5.—Institution of Gas Engineers.—Annual Conference in Leeds.

Obituary.

WILLIAM BROWN DAVIDSON.

It came as a great shock to us, as it must have done to his many other friends, to learn of the sudden death, on the 23rd inst., at his residence, Warkworth House, Tynemouth, of Dr. W. B. Davidson. Of late years we have enjoyed his close collaboration in connection with the annual issue of the "Gas Journal" Calendar and Directory, and his valuable help in this connection will be difficult to replace. As a contributor to the "Journal" pages, also, he has frequently rendered services which have been greatly appreciated, and will be as greatly missed. As a friend, we shall long remember the sincerity and charm which marked his every word and action.

Born near Inverness on Oct. 21, 1869, Dr. Davidson was educated at Guisachan Public School, Beauly, and at Raining's School, Inverness. He entered Aberdeen University in 1885, and graduated M.A. in 1890; three years later he took the B.Sc. degree "with honourable distinction." After a year of research with Prof. Japp, he was awarded an 1851 Exhibition Scholarship, and proceeded to Germany, where he carried out research work at the University of Wurzburg under Prof. Hantzsch, and also studied under Dr. Medicus and Dr. Röntgen (the discoverer of the X-rays). For a further year he made a special study of Physical Chemistry under Prof. Ostwald at the University of Leipzig, and in 1898 obtained the degree of Ph.D., "*summa cum laude.*" On returning to this country he graduated D.Sc. of Aberdeen University in 1899, and in the following year was elected a Fellow of the Institute of Chemistry. After acting as Research Assistant to Prof. Campbell Brown, of Liverpool University, and then as Lecturer in Physical Chemistry at Aberdeen University, he was appointed in 1902 Research Chemist in the experimental department of the Royal Arsenal, Woolwich. In May, 1905, he joined the City of Birmingham Gas Department as Chief Chemist, and carried out a brilliant series of researches on "Carbonization of Coal," details of which appeared in the pages of the "Journal." He was awarded the Murdoch Gold Medal in 1911 for his paper on "Carbonization," read at the meeting of the Institution of Gas Engineers. In the same year he was appointed Engineer-in-Charge of the Nechells Gas-Works, which position he held until 1915, when he joined British Dyes, Ltd., of Huddersfield, as Chief Chemical Engineer. On relinquishing his position with the works of the Birmingham Gas Department, Dr. Davidson was presented with a silver tea and coffee service, with a salver, which was inscribed: "Presented to Dr. W. B. Davidson by the staff and workmen of the Corporation Gas Department, Birmingham, on his resignation as Engineer of the Nechells Works, August, 1915." At Huddersfield, his work on the extraction of toluole from coal gas, for the production of trinitro-toluene in the early years of the war, was later acknowledged by a grant from the Royal Commission on Awards to Inventors. Since 1919 he had practised as Consulting Chemist in partnership with Dr. A. C. Michie, of 12, Akenside Hill, Newcastle-on-Tyne.

Dr. Davidson was a member of the Tar Products Test Committee, being responsible for the test for determining sulphur in benzole, and was a member of the "B.E.S.A." Committee on Sampling and Analysis of Coal. During his long and active career he wrote many papers, as the volumes of the "Journal" from 1905 to 1914 testify. He was also author of "Gas Manufacture" (Longmans, 1923).

He was the most unassuming of men, and his kindly disposition endeared him to the many friends he had all over the country. He is survived by a widow and three daughters and three sons. A short service was held at Warkworth House, Tynemouth, on Friday afternoon, April 25, and the remains were taken to Inverness for interment at Tomnahurich Cemetery, Inverness, on the following day.

AN APPRECIATION.

By A. W. Smith, General Manager and Secretary, Birmingham Corporation Gas Department.

The news of Dr. Davidson's sudden death has been a great shock to the many friends he made while in the service of the Birmingham Gas Department.

He had a brilliant university career, and after holding uni-

versity lectureships, he was appointed to a post at Woolwich Arsenal, which he occupied for a few years, subsequently coming to Birmingham as Chief Chemist to the Birmingham Gas Department on May 1, 1905.

In addition to possessing to an outstanding degree scientific ability, particularly in research work, he had an orderly mind and was a fine organizer. His job at Birmingham was by no means an easy one, but behind a shy and retiring exterior he concealed considerable power of determination, and succeeded in instituting thorough scientific control of the manufacturing operations of the Department; this notwithstanding frequently open opposition of the then Engineer-in-Chief (Mr. Henry Hack), who, able man as he was, had the old-fashioned distrust of the chemist.

I know from personal knowledge that in those first few years of his career in Birmingham, Dr. Davidson had an extremely uphill task, and it was of considerable credit to him that, in spite of all the difficulties, by sheer hard work and persistency he gained his way and laid the foundations of the scientific organization of this Department, which his successors have amplified and improved upon from time to time.

He was a man who was very fond of his home, and proud of his wife and family of six children. He was always anxious to help the junior members of the staff, and there are many occupying positions of responsibility in the gas industry to-day who owe a considerable debt to Dr. Davidson for the lectures he gave at the Technical College in Birmingham, and perhaps more for the words of friendly advice which he was always anxious to give to aspirants for promotion.

He was one of the first Honorary Members of the Midland Junior Gas Association, and in order to assist Junior Members he read several important papers before the Association.

He was passionately fond of his work, and his name will be remembered in connection with many valuable contributions to the technical literature of the gas industry, but perhaps from a national point of view his most valuable work was that connected with the extraction of benzole and toluole from coal gas, which enabled the gas industry to render such excellent service in the production of high explosives. It will be remembered that the process he evolved was that of washing purified coal gas with oil, and plant of his design was installed at the majority of the large gas-works in the country.

I well remember, in those early days of the war, Lord Moulton coming down to Birmingham specially to meet Sir Hallewell Rogers (who was then Chairman of the Gas Committee) and Dr. Davidson, in order to hear the latter's proposals, and he was so impressed with their practicability that he immediately gave instructions for him to go ahead and complete his experiments.

It is no exaggeration to say that the urgent necessity for the supply of toluole for explosives during the early days of the war was relieved almost entirely by Dr. Davidson's process. When he left the Birmingham Gas Department in August, 1915, to take up the position of Chief Chemical Engineer at British Dyes, he received the personal thanks of Lord Moulton for the tremendous assistance he had rendered.

As previously mentioned, Dr. Davidson was of a particularly retiring disposition, and for that reason had, I should imagine, few very close friends; but those of us whom he did honour with his friendship will always remember him as a man of fine character, and his loss will be keenly felt by those who have worked with him and who knew him well. The gas industry has lost one of its most brilliant research chemists.

The death has occurred, at the age of 77, of Mr. John Lang, of Thornton, Bradford, who for 23 years was Manager of the Clayton Gas-Works of the Bradford Corporation, and who was in the service of the Bradford Gas Department for over 40 years. He retired five or six years ago, being presented at the time with a gold watch as a mark of the esteem in which he was held. Mr. and Mrs. Lang celebrated their golden wedding anniversary in 1926.

Mr. James Nisbet, 41, Edward Street, Portadown, retired Gas-Works Manager, who died on Jan. 23 last, left personal estate valued at £1796.

Correspondence.

[We are not responsible for opinions expressed by Correspondents.]

Monthly Accounts.

Sir,—I have read with interest your recent editorial regarding Monthly Accounts, also your correspondent's letter on the same subject.

The main advantage as I see it, after many years' experience both in rendering all bills quarterly and in rendering them monthly, is that it serves our customers the same as do other merchants—the butcher, the baker, the telephone company, the electric company, the grocer, the milkman, the rent collector, the doctor, &c. Why should the utilities be the exception? The general public are accustomed to paying most of their accounts monthly—and want to. Why not with us?

We pay our invoices monthly—many inside ten days, to obtain discounts. We render detailed monthly reports to our Directors and to the Public Utility Commission, and we want to strike a balance monthly on our unaccounted-for—all of which would be very much less accurate if bills for gas sold and delivered were not rendered monthly. I am certain the consumer now would strenuously object if we suggested putting him back on the quarterly basis.

Under the old method our collections—and this is really the proof of the pudding—averaged a little less than 1 p.ct. loss yearly, or about three-quarters of 1 p.ct., to be accurate. Last year (1929) they were 0·29, or less than one-third of 1 p.ct., which, when our total billings for gas amount to over $700,000, makes a snug little saving on this account. This is very gratifying to our Credit Manager. Our Collection Department are pleased because each day's work is approximately the same; about the same number of meters are read each day, the same number of bills go out and are paid each day, there are no peak days of work or overtime, no confusion or hurry, as was the case when all meters were read within three days and billed and paid for within three days, with the inevitable regular slow or "loafing" days.

"Rental Superintendent" courteously implies that the consumer is getting all the worst of the monthly arrangement in that the assumed extra costs would ultimately be handed on to the consumer. Such is not the case, because in our instance it costs us less, in clerical labour and in collecting. It does cost us more for the actual number of bills printed and delivered. At first about twenty out of 15,000 customers objected, but when the writer explained the matter, asking them to co-operate and try it for six months with the understanding that we would then make other arrangements if they desired, only three or four insisted; the others liked it better, for they did not have to "dig up" as much money at a time, and then all their other bills were planned for monthly payment, and why not this one?

"Rental Superintendent" is right. Service is what we are constantly preaching in the States as well as in England. We spend between $15,000 and $20,000 annually in servicing house heaters, refrigerators, water heaters, and other appliances without charge, and we think we are giving good service. We also think we are bettering our service in rendering our bills monthly, and would not change back to the old method for any reason—except upon the urgent request from the great body of our customers; and there is no such desire existent.

I congratulate the South Metropolitan and the South Suburban Gas Companies on making the change, and I prophesy that inside two years their managements or their consumers would not change back "for anything."

Burton Smart,
Treasurer and Purchasing Agent.

Portland Gas Light Company,
Portland, Maine, March, 1930.

A New Smoke Abatement Society Leaflet.—A leaflet recently published by the National Smoke Abatement Society is entitled "Smoke Abatement as a Sales Factor." It deals in an interesting manner with the work of the Society, drawing attention to the great harm being done by the pollution of the atmosphere by smoke, and points the way towards the diminution of this evil by the educating of the public in the use of smokeless fuels. Smoke abatement, it states, is developing as an independent sales agent to the manufacturer and distributor of smokeless mediums and appliances.

Good Results at Steyning.—The annual meeting of the Steyning Gas Company, Ltd., was held on April 15—Mr. A. Grey, Chairman and Managing Director, presiding. The Chairman, moving the adoption of the report and accounts for 1929, called attention to the exceptional increase in the sale of gas to the extent of 1,989,300 c.ft., or nearly 16 p.ct. They had obtained 52 new customers, and the number of cookers and gas fires installed had been increased by 11 p.ct. and 20 p.ct. respectively. A dividend of 7 p.ct., *less* income-tax, was authorized.

Commercial and Industrial.

Stock Market Report.

[For Stock and Share List, see later page.]

The Stock Exchange was still under the cloud of the Budget last week, and business in most markets was disappointing. The only bright spot was the 5 p.ct. War Loan, which touched 103$\frac{15}{16}$—the highest price since the record of 103 in 1923.

Gas stocks and shares, however, have not been materially affected by the political situation, and prices remain steady. The outstanding feature last week was the further rise of 10 points in Imperial Continental capital stock to 410. At the beginning of the year this stock stood at 340, so that there has been an increase of 70 points to date, though at one time last year it changed hands at the high price of 495. Croydon sliding-scale hardened a point to 106½, and at this price a purchase should prove a profitable investment. The Company is in a strong financial position, and the dividends have been steadily increasing for the past few years—viz., 1926, 6½ p.ct.; 1927, 6¾ p.ct.; and for 1928 and 1929, 7 p.ct. On the basis of the latter distribution, the yield at the present price is £6 11s. 5d. Attention is also drawn to the Brighton and Hove 5 p.ct. consolidated stock which should be obtainable at about par. The dividend for the past two years has been at the rate of 6¾ p.ct., so that for the security offered the yield is a high one, and some improvement in value appears to be justified.

Other increases last week occurred in Newcastle and Gateshead consolidated, which was in demand on the local exchange, and the price rose 1¾d. to 16s. per £1 unit. South Metropolitan ordinary hardened ½ point to 102.

Current Sales of Gas Products.

The London Market for Tar, Tar Products, and Sulphate.

London, *April* 28.

To-day's prices for tar products are as follows:

Creosote for export is 6d. to 6¼d. per gallon f.o.b.

Pitch is 47s. 6d. per ton f.o.b.

Pure toluole is 2s. 4d.; solvent naphtha, 95/160, about 1s. 5d.; pure benzole, about 1s. 11d.; and pyridine bases, 3s. 9d.—all per gallon.

Tar Products in the Provinces.

April 28.

The average prices of gas-works products during the week were: Gas-works tar, 21s. to 26s. Pitch—East Coast, 46s. f.o.b. West Coast—Manchester, Liverpool, Clyde, 46s. f.o.b.* Toluole, naked, North, 1s. 7¼d. to 1s. 8¼d. Coal-tar crude naphtha, in bulk, North, 9d. to 10d. Solvent naphtha, naked, North, 1s. 3d. to 1s. 3½d. Heavy naphtha, North, 1s. to 1s. 0½d. Creosote, in bulk, North, liquid and salty, 3½d. to 3¾d.; low gravity, 1¼d. to 1½d.; Scotland, 3½d. to 3¾d. Heavy oils, in bulk, North, 5¼d. to 6d. Carbolic acid, 60's, 2s. 4d. to 2s. 5d. prompt. Naphthalene, £12 to £14. Salts, £5 to £5 10s., bags included. Anthracene, "A" quality, 2½d. per minimum, 40 p.ct., purely nominal; "B" quality, unsaleable.

* It is proposed in future to quote all prices for pitch on the basis of f.o.b. In order to arrive at the f.a.s. value at any port, it will be necessary to deduct the loading costs and the tolls whatever they may be.

Tar Products in Scotland.

Glasgow, *April* 26.

Refined coal tar continues rather dull in Scotland at the present time, and values have further decreased during the week. Other products are unchanged in value although orders are scarce all round.

Pitch is now commanding some attention for shipment next season. Export value is 47s. 6d. to 50s. per ton f.a.s. Glasgow, and home value is about 50s. per ton *ex* works.

Tar.—In an endeavour to attract business distillers have lowered quotations to about 3¼d. to 3¾d per gallon f.o.r. works in buyers' packages.

Creosote is unchanged. B.E.S.A. specification is 3½d. to 4d. per gallon; low gravity, 3d. to 3¼d. per gallon; neutral oil, 3d. to 3¼d. per gallon—all *ex* works.

Cresylic.—The market is quiet, but prices are steady. Pale 97/99 p.ct. is 1s. 8¾d. to 1s. 9¾d. per gallon; dark 97/99 p.ct., 1s. 7¼d. to 1s. 8¼d. per gallon; pale 99/100 p.ct., 1s. 11½d. to 2s. 0½d. per gallon—all at makers' works.

Crude naphtha continues easy at about 4¾d. to 5¼d. per gallon *ex* works.

Solvent Naphtha.—90/160 grade is about 1s. 2½d. to 1s. 3½d. per gallon, and 90/190 grade is about 1s. to 1s. 1d. per gallon.

Motor benzole is steady at 1s. 6d. to 1s. 6½d. per gallon free on rails makers' works in bulk.

Pyridines remain very quiet. 90/140 is 4s. 3d. to 4s. 6d. per gallon; 90/160, 3s. 3d. to 3s. 6d. per gallon; 90/180, 2s. 6d. to 2s. 9d. per gallon; and 90/220, about 1s. 6d. to 2s. per gallon.

Benzole Prices.

The following are considered to be the market prices at the present time:

	s. d.	s. d.	
Crude benzole . . .	0 10 to	0 11	per gallon at works
Motor ,, . . .	1 5½ ,,	1 6½ ,, ,,	,,
Pure ,, . . .	1 10 ,,	1 11 ,, ,,	,,

Coal Markets.

There is very little to report from the coal markets, and conditions all round remain very depressing. Owing to lack of trade, the Easter holidays were spun out as far as possible, but there was no difficulty afterwards in meeting demand. On the North-East Coast, producers of all kinds of coal are hard up for trade, and much idle time appears to be in prospect, especially as there is no obvious reason why things should improve. The mild winter has left unusually large stocks everywhere on the Continent, so that even the opening of the Baltic season is unlikely to make much difference. Gas coals are a very easy market. Wear specials are nominally 16s. 6d. to 16s. 9d. f.o.b. Quantities of bests are available at 15s. 9d., and many brands of seconds are freely offered down to 13s. 3d. to 13s. 6d. Coking unscreened are 13s. 6d. to 13s. 9d.

Similar reports come from all districts, both as regards home trade and exports; lack of prompt demand and prospects combining towards a very depressing state of affairs. The Yorkshire export price for screened gas is 15s. 9d. to 16s. 6d., but production everywhere is fully up to demand.

Gas coke is in very fair demand, and 21s. to 22s. is an average price on most markets.

Trade Notes.

"Simplex" Water Gas Plant for Annan.

The Annan Gas Company, Ltd., have placed an order with the Vertical Gas Retort Syndicate, Ltd., of 17, Victoria Street, S.W. 1, for an improved "Simplex" water gas plant.

A Review of Diesel Practice.

A publication recently issued by Prices Patent Candle Company, Ltd., of Battersea, S.W. 11, is entitled "An Historical Survey of Diesel and Semi-Diesel Practice." The matter contained in the publication is a series of articles reprinted from "Gas and Oil Power," and deals with the progress of Diesel engines from the time of their inception in about the year 1893, when they were originally constructed to utilize coal-dust fuel.

"Lux" Purifying Material.

In the "Journal" for April 16, noticing the death of Dr. Frederick Lux, we stated in error that the firm of Frederick Lux ceased to exist at the close of 1928. Actually, until Dec. 31, 1928, "Lux" purifying material was manufactured by the firm of Friedrich Lux G.m.b.H. From Jan. 1, 1929, the business was transferred to the firm Luxmass2 G.m.b.H., of which Dr. Friedrich Lux was Manager until his death. His own firm, Friedrich Lux G.m.b.H., of which Dr. Lux was owner and Manager until his death, was, however, never dissolved. It still exists to-day, and is occupied with the manufacture and marketing of water meters, "Lux" gas balances, patent Siemens-Abady analysis apparatus, and Prof. Dr. Otts gas analysis apparatus.

Overseas Opportunities.

[From the Board of Trade Journal.]

New Zealand.

Gasholder.—H.M. Trade Commissioner at Wellington reports that the Dannevirke Borough Council are calling for tenders, to be presented in New Zealand by an early mail, for the supply and erection of a single-lift spiral-guided gasholder of 50,000 c.ft. capacity. Alternative tenders for the construction of a similar gasholder, but column-guided, will be considered. Interested British firms can obtain further particulars of this call for tenders upon application to the Department of Overseas Trade, 35, Old Queen Street, S.W. 1. (Ref. A.X. 9440.)

Straits Settlements.

Cast-Iron Straight Spigot and Socket Pipes in Lengths of 9 ft. and 12 ft. in Various Diameters from 3 in. to 12 in.—H.M. Trade Commissioner at Singapore reports that the Municipality of Singapore is calling for tenders, to be presented by May 28, 1930, for the supply of the above. Firms desirous of offering cast-iron pipes of British manufacture can obtain further particulars upon application to the Department of Overseas Trade, 35, Old Queen Street, S.W. 1. (Ref. A.X. 9457.)

Contracts Open.

Engine and Cylinder Oil.

The Sutton-in-Ashfield Urban District Council invite tenders for the supply of engine and cylinder oil. [See advert. on p. 258.]

Gasholder and Tank.

The Wallingford Corporation invite tenders for the supply and erection of a spirally-guided gasholder and steel tank. [See advert. on p. 258.]

Pipes and Fittings.

The Sutton-in-Ashfield Urban District Council invite tenders for the supply and delivery of British puddled iron tubes and fittings. [See advert. on p. 258.]

Reinforced Concrete Foundations.

The Wallingford Corporation invite tenders for reinforced concrete foundations. [See advert. on p. 258.]

In To-Day's "Journal."

Institution Conference Programme.

The programme for the Conference of the Institution of Gas Engineers at Leeds on June 2 to 6 will be found on later pages. Mr. Charles S. Shapley, M.I.Mech.E., will preside; and the arrangements are singularly attractive.

* * * *

Largest Positive Type Station Meter.

What is claimed to be the largest positive type station meter in the world is illustrated by a photograph in to-day's "Journal." This is of the "Connersville" type which was ordered from Messrs. W. C. Holmes & Co., Ltd., of Huddersfield, by the Coppée Company (Great Britain), Ltd., who have the contract for a new coke oven installation of considerable magnitude for a plant to be erected for the Broken Hill Proprietary Company, Ltd., at their works in Australia. The meter will deal with 31 million c.ft. of coke oven gas per 24 hours.

* * * *

Board of Trade Inquiry at Exmouth.

A Board of Trade inquiry into the application of the Exmouth Gas Company to acquire a site for gas manufacturing and storage purposes was held at Exmouth on April 24, conducted by Mr. J. F. Ronca, Director of Gas Administration for the Board of Trade. The case for the Gas Company was in the hands of Mr. Cope Morgan, and Mr. W. Doig Gibb appeared as expert witness. Mr. W. T. Monckton, K.C., was for the opposition.

* * * *

Notes on New Books.

The new editions of two useful publications are the subjects of brief reviews in our "Notes on New Books" columns this week. The Annual Reports of the Society of Chemical Industry on the Progress of Applied Chemistry, 1929, Vol. XIV., is invaluable to those desirous of keeping abreast with the development of science in the field of industry. In it there are sections of particular interest to the gas industry, while the complete publication forms a résumé of the outstanding literature of the year on the subject of applied chemistry. The other publication is the "Water Engineers' Directory and Handbook, 1930," and this has now appeared in an enlarged and more useful form. The matter is set out in a clear and concise manner, and should prove of great service to all water engineers both at home and in the dominions.

* * * *

"W.-D." Installation at Waddon.

An extract from the Croydon Gas Company Co-partnership Magazine of an article by Mr. G. W. G. Tatam describes an installation of Woodall-Duckham intermittent vertical retorts at the Waddon Works of the Croydon Company. It is stated that until 1928 the Company had always given preference to horizontal systems, but the rapidly increasing requirements of the district and the small area of ground available at Waddon made it necessary to find means for producing large volumes of gas on relatively small areas. This intermittent vertical system was therefore chosen.

* * * *

Bombay Gas Company's Meeting.

When due allowance is made for the adverse conditions of trade in Bombay all the year, the accounts may be regarded as very satisfactory, said Mr. William Graham Bradshaw, C.B.E., presiding at the General Meeting of the Bombay Gas Company, Ltd., on April 23. The total quantity of gas sold was 478,765,000 c.ft., being an increase of 0·8 p.ct. over the previous year. The net result of the year's work is a balance of profit of £23,440, which is more than the profit of the previous year by £2553. A final dividend of 4 p.ct. (*less* income-tax at 2s. 6d. in the pound) was declared, making 7½ p.ct. for the year.

* * * *

A Recent Development in Gas Purification.

Mr. A. M. Beebee, of the Rochester Gas and Electric Corporation, has been carrying out investigations in America upon a bye-product which, he thinks, promises to become valuable to gas undertakings. Ammonium thiocyanate, says Mr. Beebee, will, when heated, unite with itself to form thiourea. This thiourea when mixed with formaldehyde forms a condensation product which resembles Bakelite in that it can be machined and moulded, while it has an advantage over Bakelite in that it can be made colourless. It is fireproof and can be used in radio construction, telephones, cutlery, optical work, and countless other ways, and it is hoped that later developments may show some more interesting facts on additional uses and commercial possibilities. At present the Rochester Corporation are co-operating with the Koppers Company in developing a market for the material.

* * * *

Secretary Required for Sunderland.

The Sunderland Gas Company, as will be seen from our advertisement columns, are asking for applications for the post of Secretary. The commencing salary will be not less than £800 per annum, and candidates should be between 35 and 45 years of age. Also, they must possess considerable secretarial and accountancy experience in a gas undertaking.

* * * *

Post in the Colonies.

From our advertisement columns it will be noted that a post is vacant, carrying a salary of £1000 per annum, with house allowance and bonus, for an Engineer and Manager to a British Colonial Gas Undertaking. Applicants must be aged about 30 to 35, hard workers, of practical experience, and keen to extend business.

* * * *

Mr. J. T. Spencer's Presidential Address.

That main and service complaints are being steadily reduced as a result of the installation of a gas-drying plant at the Weston-super-Mare Works is emphasized by Mr. J. T. Spencer in his Presidential Address before the Western Junior Gas Association on April 26. The beneficial effects upon the meters is also noticed by the meter makers to whom a portion of the meters are sent for repair, who state that there is a gradual but very decided improvement in the condition of the meters compared with some time ago. Mr. Spencer goes on to deal with various aspects of gas distribution in Weston, and explains in detail the particulars of their public lighting. In this connection he says that the by-pass failures for the past twelve months on the clock-controlled lamps work out at 0·24 p.ct. per day. The domestic lighting is cared for by a maintenance system whereby consumers' burners are periodically cleaned and adjusted free of cost, a charge being made for replacements only. Mr. Spencer is of opinion that all gas undertakings should offer generous allowances for obsolete apparatus, particularly gas fires, in part exchange to consumers, in order to dispose of these antiquated appliances to the mutual advantage of the undertaking and of the consumer.

* * * *

Gas Exhibition at Cambuslang.

Photographs are published, together with a report of the official opening, of an exhibition of gas lighting and heating appliances held at Cambuslang, Lanarkshire, a fortnight ago.

Gas Supply Company Dividend.—The Gas Supply Company, Ltd., who control numerous gas-works in Victoria, New South Wales, and Queensland, have declared an interim dividend for the half-year ended Dec. 31, 1929, at the rate of 10 p.ct. per annum.

Cookery Demonstrations at Bradford.—The Bradford Corporation Gas Department have taken a stand for daily demonstrations of cooking by gas at an Ideal Home Exhibition at the Olympia Hall, Bradford, from April 29 to May 10. The Department are also running a home baking competition, particulars of which are available at the Gas Showrooms in Darley Street.

Burnley's Old Works Close Down.—The manufacture of gas at Burnley's old works in Parker Lane has now ceased, and supplies are received from the new works at Old Hall, supplemented by coke oven gas from the works of the Lancashire Foundry Coke Co., Ltd., at Altham, six miles away. The latter arrangement has been made to save the expenditure of £150,000 on an extra unit at the new works. The Corporation have at Old Hall water gas and purification plants installed at a cost of £60,000, which can be used if necessary. Consequent upon these new arrangements certain employees have been displaced, and the Gas Committee have approved a scale of compassionate allowances for men with 20 years' service.

Programme of the Institution of Gas Engineers' Conference in Leeds, June 2 to 6—President, Mr. Charles S. Shapley.

Monday, June 2.

5.15 p.m.	Council Meeting	Queen's Hotel

Tuesday, June 3.

10.15 a.m.	Reception by the Lord Mayor (Councillor N. G. Morrison, J.P.)	Victoria Hall, Town Hall
	Annual General Meeting	,, ,,
	Presidential Address	,, ,,
11. 0 a.m. to 12.15 p.m.	Prof. J. W. Cobb, C.B.E., B.Sc., F.I.C., on "The Institution and The University; Teaching and Research"	,, ,,
12.30 p.m.	Conference Photograph	Town Hall Steps
12.45 p.m.	Charter Council Photograph	,, ,,
1. 0 p.m.	President's Luncheon to Council	Lord Mayor's Rooms
2.30 p.m. to 3.45 p.m.	Mr. C. F. Broadhead, M.Inst. Gas E. (Melbourne), on "The Preparation of a New Road Binder." To be presented by Mr. Harold E. Bloor, B.Sc., B.Eng., M.Inst.Gas E.	Victoria Hall, Town Hall
4.15 p.m.	Mrs. C. S. Shapley's "At Home"	Queen's Hotel
8.30 p.m. to 12.30 a.m.	Reception and Dance	Town Hall

Wednesday, June 4.

10. 0 a.m.	Final Extraordinary General Meeting of old Institution	Victoria Hall, Town Hall
10.15 a.m.	Dr. Margaret Fishenden, D.Sc., F.Inst.P., on "Heat Transmission, with Particular Reference to Modern Methods of Expressing Convection Data"	,, ,,
11.30 a.m to 12.45 p.m.	Dr. E. W. Smith, F.I.C., M.Inst. Gas E., on "Gas Dehydration"	,, ,,
1. 0 p.m.	University of Leeds' Luncheon to Council	Leeds University
2.15 p.m. to 3.30 p.m.	Visit to the Workshops of the Leeds Gas Department	Bridge Street Works
3.45 p.m. to 5.30 p.m.	Visit to the Departments of Coal Gas and Fuel Industries and of Mining at the University of Leeds, where Tea will be provided	Leeds University
2.30 p.m. to 5.30 p.m.	Ladies' Visit to historic Temple Newsam, where Tea will be provided	Leeds
8. 0 p.m.	Council visit Theatre	Leeds

Thursday, June 5.

10. 0 a.m.	Annual General Meeting of the Benevolent Fund	Victoria Hall, Town Hall
10.15 a.m.	Mr. Edward G. Stewart, M.Inst. Gas E., on "The Functions of Coke Ovens"	,, ,,
11.30 a.m. to 12.45 p.m.	Mr. Frank Prentice, M.Inst. Gas E., on "Experiences with a Waterless Gasholder".	,, ,,
1. 0 p.m.	Council's Luncheon to President	Lord Mayor's Room
1.30 p.m. to 5.30 p.m.	Ladies entertained to Tea by Earl Fitzwilliam at Wentworth Woodhouse.	
2.30 p.m.	Mr. W. H. Hoffert, M.A., B.Sc., A.I.C., and Mr. G. Claxton, M.Sc., on "Benzole Recovery, with Particular Reference to Gas-Works Practice"	Victoria Hall, Town Hall
3.45 p.m. to 4.15 p.m.	Conclusion of Conference and Annual General Meeting	,, ,,
4.30 p.m.	Council Meeting	Town Hall

Friday, June 6.

10.15 a.m. to 4.30 p.m.	Motor Tour in Wharfedale, arranged by and under the direction of Mr. Charles Wood, O.B.E., M.Inst.Gas E., with Lunch at the Hotel Majestic, Harrogate.	

The Works of the Leeds Gas Department, and of Clayton, Son, & Co., Ltd., at Hunslet, and Wilsons & Mathiesons, Ltd., at Armley, may be inspected throughout the Conference.

The Directors of the York Gas Company cordially invite Members interested in the erection of a Klönne Waterless Gasholder to visit their Works.

GOLF TOURNAMENT, MONDAY, JUNE 2.

A competition for the President's Bowl, presented by Mr. Charles S. Shapley, will be played at the Headingley Golf Club (Adel), Leeds, on Monday, June 2.

The tournament will consist of a stroke competition on lowest club handicap, and the bowl will be won outright. Tee off: 10 a.m. to 6 p.m. The arrangements are in the hands of Mr. J. E. Lister Cooper, Gas Offices, Yeadon, Nr. Leeds, to whom all communications should be addressed in connection with this tournament and the golfing arrangements generally during the Institution of Gas Engineers' Conference.

GOLF COURSES AVAILABLE

ON TUESDAY, WEDNESDAY, AND THURSDAY, JUNE 3, 4, AND 5.

The following golf courses will be open to members and their ladies attending the Institution of Gas Engineers' Conference on presentation of a Yorkshire Commercial Section Voucher, obtainable on application at the Information Bureau, Queen's Hotel, Leeds:

MOORTOWN GOLF CLUB: On the route of Harrogate 'buses, or tramcar to Moortown.
SANDMOOR GOLF CLUB: Adjoins Moortown.
ALWOODLEY GOLF CLUB: On the route of Harrogate 'buses.
HEADINGLEY GOLF CLUB: Near route of Otley 'buses.

Modern Steelwork.

Steel construction has so definitely established itself that its use no longer calls for comment, and every year sees its scope and various applications increased. Among the many materials available for modern structures, steel is the only one which is really indispensable; only steel will permit the widest spans, carry the heaviest loads, and facilitate the quickest erection. For important bridges and buildings it is the only medium which can fulfil the requirements; while at the other extreme, even the lightest structures can be built economically with steel. A comprehensive survey of modern steelwork practice and achievements is contained in the second volume of "Modern Steelwork," recently published by the British Steelwork Association, of Artillery Row, Victoria Street, S.W., which sets out in a very attractive form, accompanied by nearly 200 photographs, details of the construction of many well-known structures, utilizing steelwork, both in the United Kingdom and abroad. Among the constructions dealt with is a most interesting section on the building of the Tyne Bridge at Newcastle, which was opened by H.M. the King on Oct. 10, 1928. This bridge crosses the river in a single span of 531 ft., and the total weight of steel used in the arch is 4000 tons. Some interesting photographs illustrate the bridge in various stages during its erection. The building of many other famous buildings is dealt with, including Imperial Chemical House, some New York skyscrapers, theatres, and large office premises. There is a complete index included, together with a number of sectional diagrams of various structures. With the increased cost of building, high land values, taxation, and other economic factors, concludes the introduction, and where speed and accuracy are the vital factors, future developments will demand the most economic methods of construction—a requirement which steelwork is, and always will be, well able to fulfil.

Halifax Gas-Works Visited.—Mr. W. B. McLusky, Engineer and General Manager of Halifax Corporation Gas Department, is a strong believer in the advertising value—as well as very willing to help educative movements of local societies—of encouraging visits to the gas-works by parties of the local public, and he always makes a point, if at all possible, of being present to welcome the visitors personally. His visitors recently were the members of All Souls' Church Young Men's Bible class.

Topical Items.

British Association for Commercial Education.

This Association has been formed to bring about more consultation between all parties concerned with commercial education, and greater publicity. Nearly every branch of the subject is already being dealt with to some extent, but there is much overlapping, and no co-ordinating organization of any kind, and the finished product of schools and universities is often lowered through this lack of contact. Further, practical experience abroad for young entrants into business is difficult to obtain and can only be arranged on a national exchange basis. The Association will hold its first general meeting shortly.

The following are the objects of the Association: To advance commercial education in Great Britain and Ireland and the British Empire through co-operation between employers, employees, teachers, educational administrators, and authorities; the encouragement of definite educational work by commercial undertakings; the investigation and discussion of problems related to the aims of the Association; the holding of periodical conferences, and participation in national and international congresses; the printing and circulation of papers and reports; co-operation with other organizations of like aims and objects.

The resolution to form the Association was passed unanimously by the fifty British delegates to the International Congress on Commercial Education, which was held in Amsterdam last September. These delegates represented the main interests concerned with commercial education in this country, and they elected a Provisional Committee, under the Chairmanship (*pro tem.*) of Mr. Francis W. Goodenough, C.B.E.

New Showrooms at Ormskirk.

The Ormskirk and District Gas Company, Ltd., have opened spacious showrooms in the main street of the town—Moor Street—and these were officially opened by Mr. F. A. Jones, the Chairman of the Directors, in the presence of a gathering which included representatives of all the local councils.

The rooms on both the ground and first floors are panelled in light oak, and the whole building is replete with all the latest apparatus for lighting, heating, and cooking.

In declaring the showrooms open, Mr. F. A. Jones—who, by the way, has just retired from the position of Chairman of the Ormskirk Urban District Council, after serving his third term in that office—said that he hoped the new premises would prove a boon to the town of Ormskirk.

Mr. W. M. Mason, Manager of the British Commercial Gas Association, referred to the wonderful development in gas apparatus during recent years. The showrooms displayed the latest appliances for cooking, hot water, and lighting, and the modern adoption of gas stood for economy and efficiency, which means good service. Gas was being increasingly employed by members of the medical profession, and in the large hospitals, and the use of gas was the solution to the servant and labour problem in the home.

Alderman S. T. Rosbotham, M.P. for the Ormskirk Division, said he thought there was a great future for the use of gas, and expressed his belief that the showrooms would prove of inestimable value to Ormskirk and the district.

Mr. F. S. Hunter, the Manager of the Company, said they were anxious that the people of the district should not regard the premises as a shop, but as a showroom, where they could inspect the latest appliances, and where they could obtain the best advice appertaining to gas and its uses in the home.

Demonstrations of various kinds were afterwards given for the benefit of the many visitors to the showrooms, which constitute one of Ormskirk's most attractive business premises.

Notes from Abroad.

France Admits Foreign Appliances for Stamping.

On Aug. 7 last we outlined a scheme prepared by the French Gas Industry for the testing and certification of gas appliances, which was put in operation at the beginning of this year. We now read that the Council of the Union Syndicale have deliberated as to whether the products of foreign manufacturers should be admitted for test. The question was looked upon as delicate, but the final answer was in the affirmative, provided that where similar facilities were obtainable in the other countries concerned, they should be rendered available to the French manufacturers.

("*Journal des Usines à Gaz.*")

The German Gas Association.

From "Das Gas- und Wasserfach" we learn that the Annual General Meeting of the German Gas Association will be held this year at Stuttgart, on May 26, 27, and 28. This will be the seventy-first of the series, and those who attended the Berlin meeting last year will be interested to know that Dr. Schütte, of the Bremen gas undertaking, will again occupy the chair. The contributors of papers and reports will include Dr. Nübling, of Stuttgart, on modern gas problems, Oberbaudirektor Ludwig, of the Berlin undertaking, on distribution and meters, and Prof. Dr. Terres, on ammonium sulphate production. The customary wide choice of excursions, visits, and social functions will be available. As usual Dr. Lempelius, Manager of the Association, is in charge of arrangements, at Berlin W. 30, Geisbergstr. 5/6.

An Education Scheme in Project.

The Association Technique are working for the establishment of a centre for Advanced Gas Education. The curriculum will be suitable for students from the big schools who already possess a working knowledge of gas technology, but who would be likely to benefit from courses designed for the general enlargement of outlook. The details of the scheme are to be worked out, and the necessary staff collected for a start to be made in October.

("*Journal des Usines à Gaz.*")

Differential Charges in Paris.

The Paris Council last December adopted the principle of differential charges, in which decision they had due regard to a report drawn up by MM. Delavenne and Lebecq. These experts estimated that whereas industrial gas sales in Paris represent only 15 p.ct. of the total, a reasonable tariff would soon bring the percentage to 25. "A flat rate," they maintain, "is a commercial error which through its repercussions may easily become a far-reaching economic one." M. Delavenne suggests that concessions be granted to consumers of more than 4000 cub.m. [approx. 141,000 c.ft.] per annum; reductions from 3 to 24 p.ct. being granted. Lower rates than the normal would, further, be offered for central heating and baking; the allowances suggested being 0·15 and 0·25 franc per cub.m. respectively.

Discussions have been proceeding; but meanwhile it is interesting to note that the Prefect of the Seine fixed the price of gas for the first quarter of 1930 at 1 franc per cub.m. [approx. 5s. per 1000 c.ft.], instead of 0·90 franc.

("*Journal des Usines à Gaz.*")

Lubricating Oil.

An interesting lecture was recently delivered to Royal Air Force students on the subject of lubricating oils, with particular reference to petrol engine lubrication, by Mr. S. E. Bowrey, B.Sc., F.C.S., M.I.P.T., Chief Chemist of Messrs. Alexander Duckham & Co., Ltd., Lubricating Oil Specialists, of 6, Broad Street Place, E.C. 2. Although in practice oil requires frequent changing, said the lecturer, this is not because it is consumed in any strict sense of the term, but merely because it becomes contaminated with impurities, including compounds formed by combination with the oxygen of the air, which attacks oil just as it does steel. Mr. Bowrey went on to discuss the chief functions of lubricating oil and the qualities required for good lubrication. He made reference to the main sources of supply and described some of the refining processes. Some standard tests for lubricating oil were enumerated, including those for viscosity and flash point, and also the cold test, coke test, and oxidation test. In this latter test the oil is subjected to the action of a stream of bubbles for twelve hours at a temperature of 200° C. The lecturer finally dealt with a few of the lubrication difficulties encountered in practice. The principal causes of actual breakdown of lubrication are: Insufficient oil; excessive heat; excessive pressure due to distortion or inaccurate fitting; contamination of oil; oil of unsuitable viscosity; and corrosion. In conclusion, it was stated that a well-refined mineral oil should not contain sufficient acidity to neutralize 0·01 gramme of caustic potash per 100 grammes of oil, using phenolphthalein as indicator. The viscosity should fall within limits decided upon as suitable for the engine concerned. Messrs. Duckham & Co. will be glad to forward a copy of the lecture in pamphlet form to anyone who may be interested in the subject.

The Welding of Copper.

Until recent years it was considered that the satisfactory welding of copper was an impossibility. The high thermal conductivity of the metal gave rise to grave practical difficulties, and, even if these were overcome, it was found that the copper became brittle by the action of the gases in the acetylene flame.

With the formation of Imperial Chemical Industries, Ltd.,

technical authorities who were interested in copper welding from three different points of view came together. They were chemical manufacturers, who required welded copper vessels; copper manufacturers, who were naturally anxious to see copper placed on the same footing as the majority of other metals, as far as welding is concerned; experts in welding processes generally.

As the result of research work carried out by these three groups in collaboration, a process for welding copper has now been evolved which, we understand, renders the operation simple and safe, provided the correct materials are used. A demonstration of this welding was carried out by the Premier Electric Welding Company, Ltd., yesterday, at the Swansea Works of British Copper Manufacturers, Ltd., a subsidiary Company of Imperial Chemical Industries, Ltd. At this demonstration, copper pipes were welded together without difficulty, and the joint was subjected to severe flattening and bending tests, the results of which proved that the weld would withstand conditions of service as satisfactorily as the pipe itself. Sheets of copper were also joined together by the welding process, and it was shown that these would withstand a considerable amount of work and stretching—in fact, as much as the solid copper itself could be expected to withstand.

The welding of varnish pot seams was also demonstrated—a process which eliminated a great deal of troublesome riveting. It was observed that the welding operator worked quickly, and as easily as if he were merely brazing the pieces together, and, after the weld had been made and trimmed, it was difficult to see where the joint occurred, while it had a tensile strength equal to that of rolled copper.

The demonstration proved that the difficulties previously associated with the welding of copper had been overcome, and it would seem that there is a wide field in industry for the application of the process. Riveting will be largely eliminated, and vessels which previously had to be forged out of solid copper—a very expensive procedure—can now be built up by welding sections together. This has been achieved by means of slight modifications in the technique of welding ferrous metals, by the use of copper alloy filler rod, and flux of the appropriate type. The copper which has been developed for welding purposes is not attacked by the gases of the acetylene flame, and it is essential to use this copper if the weld is to be perfectly satisfactory. The copper is a modification of the tough pitch variety, supplied at the same price, but not inferior to it in any way. The filler rod is of specially modified copper, which is very fluid when molten, and so runs well into the joint, leaving no air locks or gaps. The flux is used in order to hinder the formation of scale on the red-hot copper, as the scale prevents good metallic contact being obtained.

Using these materials, which are supplied by Imperial Chemical Industries, Ltd., it was demonstrated that with an hour's practice a welder could acquire the technique of copper welding and produce sound joints as easily as he could with ferrous materials.

How Halifax is Selling Gas for Lighting and Water Heating.

Some time ago the Halifax Gas Committee authorized Mr. W. B. McLusky, their Engineer and Manager, to fix appliances without a meter in those cases where he could supply gas through a standard orifice and a governor. Now the slogan for water heating is: Fourpence a day is all you pay. This applies to a night and day supply of hot water via the "Sunhot" storage apparatus.

Fig. 1 shows the "Sunhot" fitted into the existing system. The two-way valve is intended to cut out the "Sunhot" when the coke fire is burning, or to cut out the cylinder when the fire is cold. Obviously the connections can be so arranged that the cylinder can be retained in the circulation in addition to the "Sunhot" boiler.

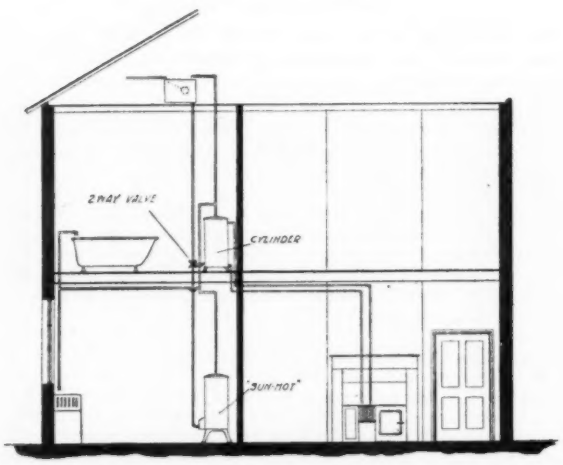


Fig. 1.—Showing "Sunhot" coupled to existing system. Hot water can be obtained either from the existing system or from the "Sunhot" through the two-way valve. Hot water service to bath and kitchen sink.

Fig. 2 shows the "Sunhot" taking the place of the ordinary cylinder; while fig. 3 shows the "Sunhot" doing all the work.

The supply for the gas-fired boiler is taken direct from the service pipe; there is no gas meter. As mentioned, the slogan is: "FOURPENCE A DAY IS ALL YOU PAY;" but the charge of 4d. is limited to the 20-gallon size. For larger sizes the Department charge more. The orifice of the "Sunhot" boiler is controlled by a governor, and, taking one heater with another, the average consumption of gas per annum is 50,000 c.ft.

Gas Lighting.

The gas switch is a small part of the installation, and the Halifax Gas Department provide, deliver, and fix a pendant or bracket, complete with burner, mantles, and glass, and a "Newbridge" positive switch, all for twelve payments of 2s. 6d.

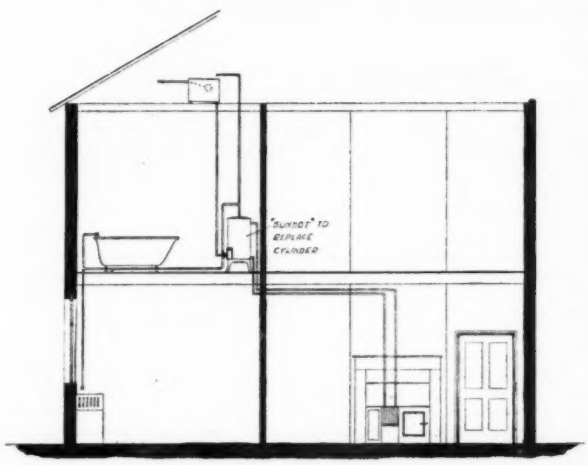


Fig. 2.—Showing "Sunhot" fixed in place of hot storage cylinder and connected to existing system. Hot water service to bath and kitchen sink.

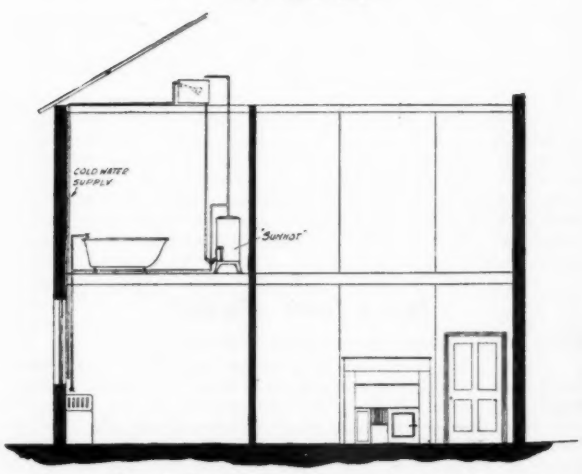


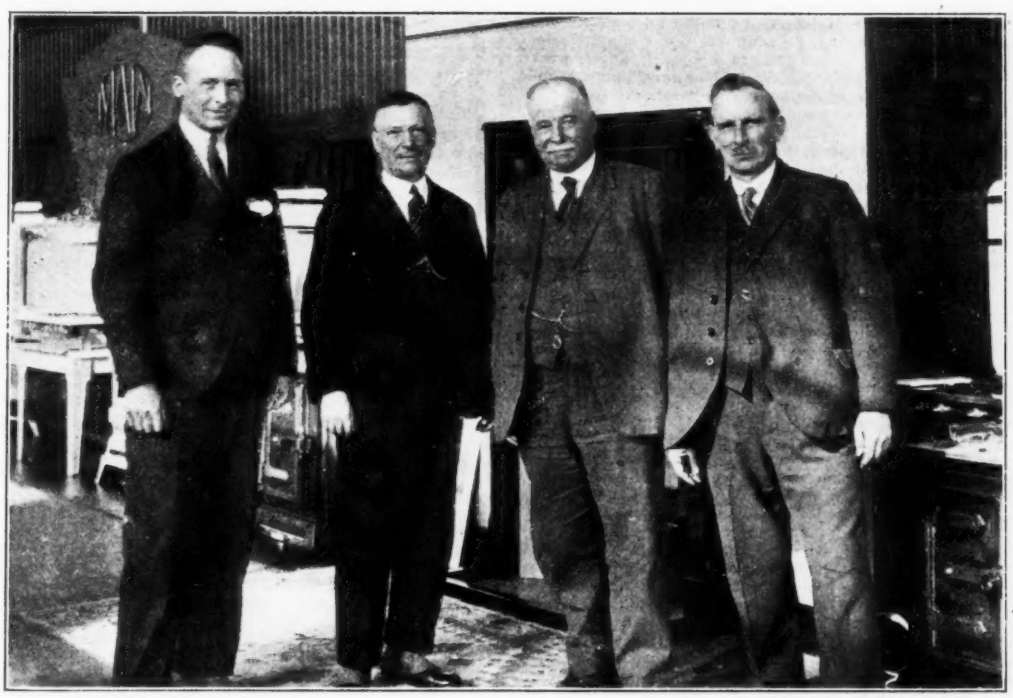
Fig. 3.—Showing "Sunhot" service to bath and kitchen sink.

per quarter. The Department maintain the installation and give the consumer two mantles free per annum; the maintenance continues after the quarterly payments cease and the installation becomes the property of the consumer.

If the customer pays another rent of 6s. 6d. per quarter for the use of the gas establishment, the gas supply is charged at 2s. per 1000 c.ft.

Scottish News.

Successful Gas Exhibition at Cambuslang.



OFFICIALS OF THE COUNTY OF LANARK DISTRICT MIDDLE WARD GAS UNDERTAKINGS.

Left to right: Mr. D. Melvin, Works Manager at Uddingston; Mr. T. Royden, General Manager; Mr. Owen Coyle, J.P., Convener; and Mr. A. Simmons, Works Manager at Cambuslang.

The accompanying photographs were taken at an Exhibition of gas lighting and heating appliances held at Cambuslang, Lanarkshire, a fortnight ago. The Exhibition, which was under the ægis of the Lanark County Council (Middle Ward) Gas Undertaking—of which Mr. T. Royden, Uddingston, is General Manager—proved very successful, and during the five days it lasted (April 7-11) attracted large numbers of visitors.

The chief exhibitors were Messrs. R. & A. Main, Ltd., who made a special display of enamelled cookers; Messrs. Milne & Mitchell, Glasgow, whose display of lighting fittings attracted much attention; the Wonder Washer Company, Limited, of

GENERAL VIEW OF ONE OF THE SIDE DISPLAYS.

London; and Messrs. John Scoular, Ltd., Cambuslang. Cookery demonstrations were given twice daily by Miss E. M. Dods.

All who took part expressed themselves as being well satisfied—even surprised—with the results, which reflect credit on Mr. A. Simmons, Manager of the Cambuslang Works, and all concerned.

County Councillor D. J. Black, J.P., who presided, expressed pleasure at seeing such a large and representative attendance at the opening ceremony. Since the Middle Ward District Committee had taken over the old Gas Company, he said, the Gas Committee had had rather a rough time. They had reached a point, however, where all the gas undertakings in the Middle Ward had amalgamated, and, so far as the people of Cambuslang were concerned, the immediate result of that amalgamation had been a reduction of 9d. per 1000 c.ft. in the price of gas. He was hopeful that there would be still further reductions under the new régime, but on that subject Councillor Coyle, who was Convener of the Gas Committee, was more qualified to speak. The Exhibition had been arranged to interest the people of the district in gas and the various purposes to which it could be applied.

Councillor Owen Coyle, J.P., in declaring the Exhibition open, stated that his first duty was to extend a welcome to all present at this, the first, Exhibition in connection with the Middle Ward Gas Undertaking. As most of them would be aware, he continued, the Middle Ward District Committee set out a number of years ago on a policy of acquiring the local gas-works throughout the Middle Ward, being of the opinion that such a public utility service as gas should be in the hands of, and controlled by, the local authority. They acquired the Cambuslang Gas Undertaking in the year 1920, and at different times they acquired other undertakings, numbering ten in all. A local authority, however, as compared with a gas company, had many difficulties to encounter. It was tied up by Act of Parliament and by regulation, and they found that for a number of years they could only carry on their gas undertakings in sections. Each local gas area had to be run as a separate unit, and, as a result, they were unable to get the benefits they had anticipated of amalgamation and centralized working. Eventually, however, they were able to get the necessary powers from Parliament, and as from May last they had combined all the gas districts. This enabled them to centralize manufacture; to combine staffing, and to work the whole concern as one business and on a commercial basis. The results of this would undoubtedly be to make for economy and cheaper gas. Unfortunately, in addition to being loaded with a heavy debt for the purchase of the private gas companies, they had had very trying times to pass through in recent years. They had a coal strike and a coal stoppage, and with high prices for coal and difficulties of supply, the price of gas had, unfortunately, to be raised. By the combination of the gas supply districts, however, to which he had referred, they had been able to get a flat price of gas introduced, and Cambuslang had experienced the benefit this year by a cut in its price of 9d. per 1000 c.ft. The following facts in connection with the gas undertaking might be of interest. The make of gas per annum, in the Middle Ward, amounted to 619 million c.ft. There were 176 miles of main piping. The number of meters (ordinary and slot) was 27,233.

Mr. Coyle went on to show that local and Imperial taxation was mainly responsible for the high price of gas in Cambuslang, pointing out that of the 5s. charged per 1000 c.ft. in this district, no less than 3s. 6d. went for these purposes. But, concluded Mr. Coyle, we are bent on making the gas undertaking a success, and to-day's Exhibition is one of the methods by which we hope to accomplish that end. The uses of gas are too numerous to mention, and the exhibits that are shown to-day will, I am certain, interest and appeal to many of you. From the standpoint of public health we are also urging as a local authority that more use should be made of gas and so avoid the pollution of the atmosphere by smoke.

Mr. T. M'Ewan proposed a vote of thanks to Mr. Coyle.

New Gas-Works for Elgin.

Work to be Started on May 12.

Estimated to cost £40,000, new gas-works are to be constructed at Elgin. The work is to be started on May 12. The Elgin Corporation have received a grant through the Unemployment Grants Committee, to the extent of 50 p.ct. of the interest on the approved expenditure out of loan, not exceeding £40,000, raised to meet the cost of the scheme, the grant to be made payable for fifteen years. The grant will relieve the ratepayers of any increase in the price of gas.

In an interview which a "Journal" correspondent had with the Gas Manager, Mr. Peter Low, it was explained that Elgin is being enabled to procure a complete and modern installation for the manufacture and purification of gas, without any increase to the selling price.

"The consumption of gas has steadily increased in Elgin," said Mr. Low. "The Elgin Town Council have been steadily building new houses, and this has created much business for the Gas Committee."

Gas Exhibition at Stranraer.

"There is a disposition in certain quarters to suppose that the Town Council are somewhat antagonistic to the Gas Company. I am pleased to have this opportunity of saying publicly that the idea is entirely erroneous." This was the statement made by Provost Waddell, Stranraer, at the opening of a gas exhibition which was held in Stranraer last week by the local Gas Company.

Prize for Essay on Gas Manufacture.

A prize has been offered by Mr. J. Wilson, Gas Engineer at the Motherwell Works, to the members of the junior section of the local Y.M.I., for the best essay on gas manufacture. The offer was made at the conclusion of a visit made to the works by the lads, when they were shown round the plant by Mr. Wilson.

Lecture at Kilmarnock.

"Kilmarnock's Gas Supply, the Story of its Beginning and Development," was the subject of a lecture delivered by Mr. Charles Fairweather, Manager of the Corporation Gas-Works, to the members of the Kilmarnock Rotary Club.

Extensions at Johnstone.

The alterations at the Johnstone Gas-Works, which were commenced some time ago, are expected to be completed by the end of the year.

New Holder for Banknock.

Formal application has been made by Denny Town Council for a Government grant for the erection of a gasholder at Banknock.

Low-Temperature Carbonization at Glasgow.

It is understood that the Glasgow Corporation are to be asked to appoint a special Committee to consider and report on the question of installing a low-temperature carbonization plant at the Dalmarnock and Pinkston generating stations.

Cable-Box Explosion.—When an explosion occurred in an electric cable-box at the corner of Vere Street, Oxford Street, London, the cover of the box was blown off, and clouds of smoke arose, followed by a series of minor explosions. Police and firemen formed a cordon around the spot. The current was turned off, and shops in the district were without electricity for some hours.

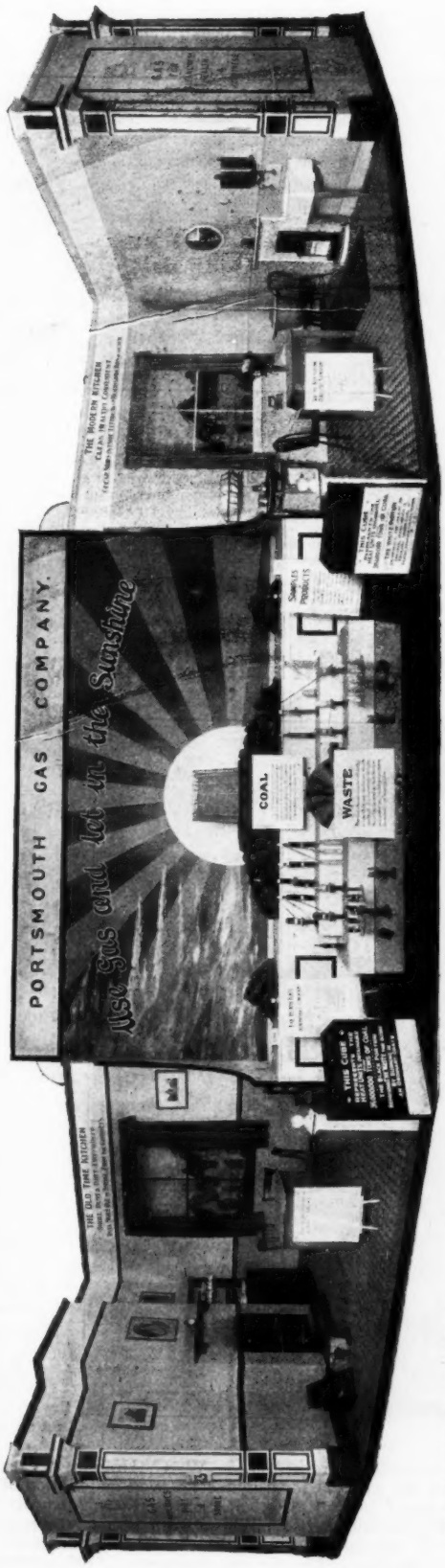
Eastern Counties Gas Managers' Association.—The Half-Yearly Meeting of the Association will be held in Harwich on Friday, May 16. The President, Mr. A. Gregory, will deliver his Address, and a paper entitled "Competition in Rural Areas; How Can it Best be Met?" will be read by Mr. C. R. Fowler, of Leiston. Members will be entertained at luncheon by the Chairman and Directors of the Harwich Gas and Coke Company, Ltd.; and the gas-works and the Great Eastern train ferry will be inspected.

Safeguarding and Incandescent Mantles.—Writing in "The Times" for April 25, Mr. W. H. Harvey stated that the incandescent mantle is now a very important and necessary item of gas-lighting equipment, and it would be hardly too much to state that mantle-making has become a "key industry" so far as gas lighting is concerned. The nation's experiences in the war demonstrated the importance of "key" industries, and it is to be hoped, therefore, that Mr. Snowden will not be too eager to drop safeguarding in respect to mantles, and thus allow a necessary homeland industry to be crushed by foreign imports.

Worthing Stock Issue.—The Directors of the Worthing Gas Light and Coke Company are offering for sale by tender £25,000 5½ p.ct. irredeemable preference stock, at a minimum price of issue of par, ranking with existing 5½ p.ct. preference stock. Tenders must be for amounts of £10 or upwards in multiples of £1, and must be sent in not later than 11 a.m. on Friday, May 2, on the form issued by the Company from 55, Chapel Road, Worthing.

Bognor Stock Issue.—As will be seen from our advertisement columns, Messrs. A. & W. Richards, of 37, Walbrook, E.C. 4, are offering for sale by tender, on behalf of the Directors of the Bognor Gas and Electricity Company, £14,000 new consolidated stock, or such an amount as will, with premiums, realize the sum of £14,011 18s. 2d., ranking for a maximum dividend of 7 p.ct.; also an issue of £11,000 5½ p.ct. redeemable debenture stock, to be redeemed at par on Jan. 1, 1940.

Electric Radiator Fatality in a Bathroom.—That insufficient care is not invariably exercised when electric radiators are in use in bathrooms was shown at a recent Malden (Surrey) inquest. A woman friend told the Coroner that the victim went to have a bath, and some minutes later witness heard a scream. Rushing upstairs, she found the deceased woman in the bath and leaning over the side. A small portable electric radiator, which had been standing on a shelf, was in the bath. A doctor said death was due to electrocution, evidently caused by the radiator falling into the water. There were no signs of injury except one small burn.



This photograph is of the Portsmouth Gas Company's exhibit at a recent Trades Exhibition held in Portsmouth. The local Coal Merchants' Association have been advertising the use of coal considerably, and have made many attacks upon the use of gas. Therefore Mr. T. Carmichael, the Company's Engineer, decided that the exhibit should be a combined bye-product and smoke-abatement display. The back and window screens, together with a model of one of the Company's holders, were made and painted by members of the Sales Staff. Concealed lights were fitted behind the coal, which enhanced the sun effect. Lights were also fitted outside and above the windows, to give a similar effect. The exhibit was very favourably commented upon by many people, and it constituted a striking reply to the coal merchants' propaganda.

A Recent Development in Gas Purification.

A Bye-Product which Promises to Become Valuable.

By A. M. Beebee, General Superintendent, Gas Department, Rochester Gas and Electric Corporation.

[From the American Gas Association Monthly.]

Until June, 1928, it was the practice of the Rochester Gas and Electric Corporation to pass the coal gas through the Koppers liquid purification process after it left the acid saturators and then through dry oxide boxes. The gas, before entering the liquid purification process, contained about 400 grammes of hydrogen sulphide and 48 grains of cyanogen compounds per 100 c.ft. of coal gas. In the liquid purification process approximately 90 p.ct. of the hydrogen sulphide and 100 p.ct. of the cyanogen were removed. The sulphur in the hydrogen sulphide was removed as finely divided sulphur in the thionizers where air is blown through the liquid purification solution to remove the sulphur. The remaining hydrogen sulphide in the coal gas was removed in the dry oxide boxes. The cyanides were removed as fixed sodium salts in solution.

In the removal of the hydrogen sulphide and cyanogen compounds in this liquid purification process the gas is scrubbed by a solution of sodium carbonate with which is mixed an iron ore catalyst called ferrox. When the sodium carbonate is dissolved in water it hydrolyses to some extent with the water to form carbonic acid and sodium hydroxide which gives this solution an alkaline reaction. In the removal of the hydrogen sulphide with the sodium carbonate solution, compounds are formed, the major portion of which are actified or revived when air is blown through it in the presence of the ferrox and gives off free sulphur and regenerates the solution for re-use. So in the removal of the hydrogen sulphide no large amount of sodium carbonate is lost except by leakage in the system, and that amount of solution that is entrained in the sulphur slurry. In the case of the cyanogen compounds the result is much different unfortunately. In the absorption of the cyanogen compounds by sodium carbonate, sodium cyanide is formed which in the presence of free sulphur forms sodium sulphocyanide. When air is blown through this solution it will not reactify to form sodium hydroxide. Therefore all of the sodium carbonate used in removing the cyanogen compounds is lost. Since the cost of sodium carbonate is the main expense of the liquid purification process, it is evident that the removal of cyanogen is very expensive, and if some method could be devised whereby the cyanogen could be easily and cheaply removed before the gas reached the liquid purification process, a large economy would result.

It was with the above thoughts in mind that about eighteen months ago we attempted at the suggestion of Dr. Sperr, of the Koppers Company, to remove the cyanogen compounds by a new process. This process consisted of scrubbing the coal gas after it left the secondary washer cooler with first a weak ammonia liquor. This liquor reacted with the hydrogen sulphide in the gas to form ammonium sulphide. Then to this solution there was added some of the finely divided liquid purification sulphur. The ammonium sulphide which was formed by the reaction of the ammonium hydroxide and the hydrogen sulphide had the property of combining with the finely divided sulphur to form ammonium polysulphide. This material reacted with the cyanogen compound in the coal gas to form ammonium thiocyanate. This process removes approximately 98 p.ct. of the cyanogen compounds, and 5 p.ct. of the hydrogen sulphide. The ammonium thiocyanate liquor formed can be run through an ammonia still to recover the ammonia. Since the ammonium thiocyanate can be made into a fairly pure 30 p.ct. solution, it seems as if other markets might be found for it. We are co-operating at the present time with the Koppers Company in developing a market for this material, which has very marked chemical characteristics that are interesting to consider. Ammonium thiocyanate which has the formula NH_4CNS will, when heated to 170°-180° C., unite with itself to form thiourea, which has a formula $SC(NH_2)_2$. This thiourea when mixed with formaldehyde forms condensation products which resemble bakelite in that it can be machined and moulded. It has an advantage over bakelite in that it can be made colourless. It is fireproof and can be used in radio construction, telephones, cutlery, optical work, and countless other uses. We have only started to investigate the possibilities of the material. Later developments may show some more interesting facts on additional uses and commercial possibilities.

This is only another of the many examples that we have seen in the last few years of how slightly we have scratched the surface of the possibilities that lie in the materials which we handle every day in the modern gas plant. While at the present time we may be operating for the primary purpose of producing gas, there are many reasons to believe that in a few years the tail may wag the dog, and the plant will be operated for the production of the bye-products as we now are wont to call them, and the gas will be the bye-product, such as is now the case with the coke plants.

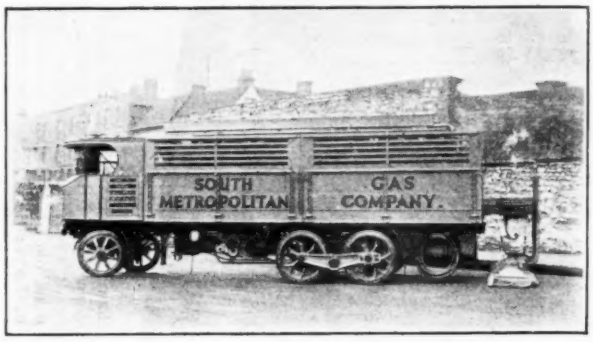
Modern Machines for Spraying Roads.

It is now over twenty years since the first "Sentinel" steam wagon equipped with a tank of 1000 gallons capacity, and tar spraying apparatus, was put into service. This wagon and apparatus, it is understood, are still in use, although built so long ago; but during this period many changes have taken place, old methods of road construction have given place to new, many new surfacing materials have been invented, the vehicles using the roads have changed in type and design, and improved "Sentinels" fitted with tank and spraying apparatus are being put into service by many well-known firms.

In 1910 the spraying machine mounted on the "Sentinel" wagon was chiefly used for drawing tar from the local gas-works, and applying it to the surface of the roads in the immediate vicinity; to-day, owing to changed conditions, this class of plant has a much wider use, and with the greatly improved vehicle to which it is fitted is no longer confined to purely local work. The manufacturer of road dressing material, and the contractor, now find that they can deliver direct by road and give quicker and better service than was possible when the material had to be handled several times during transit by rail, also, by the use of the steam pump and sprays, the surfacing material is placed directly on the road surface, thus obviating waste of time or labour in unnecessarily handling the material in the old-fashioned manner with buckets and brooms.

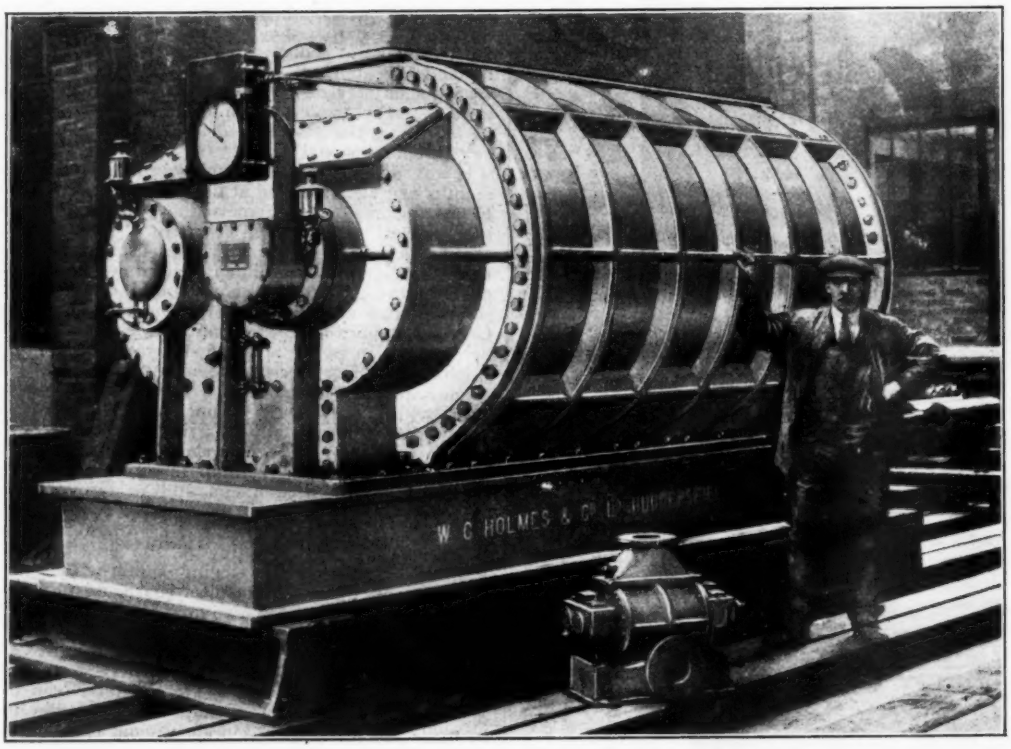
"Sentinel" wagons, with their large carrying capacity, high speed, and low running costs, lend themselves particularly well to the bulk haulage of road dressings, and owing to the large boiler capacity there is an ample supply of steam available for heating the contents of the tank and driving the steam pump for the spraying apparatus.

Not only, then, is this combination useful for delivering surfacing materials in bulk, but it is capable of surfacing the roads quickly, cheaply, and thoroughly with a high-pressure spray which gives the maximum of penetration.



One of two "Sentinel" coke-burning D.G. 6's supplied to the South Metropolitan Gas Company, fitted with 2000-gallon tank, steam pump, and tar-spraying apparatus. The large boiler capacity provides an ample supply of steam to the heating coils in the tank to maintain the correct temperature of the contents during transit, and also while spraying is in progress. The tank, pump, and spraying apparatus form a self-contained unit which can easily be removed from the body when the D.G. 6 is to be used for general transport purposes.

Largest Positive Type Station Meter in the World.



Our photograph shows a meter of the "Connersville" type which was ordered from Messrs. W. C. Holmes & Co., Ltd., of Huddersfield, by the Coppée Company (Great Britain), Ltd., who have the contract for a new coke oven installation of considerable magnitude for a plant to be erected for the Broken Hill Proprietary Company, Ltd., at their works in Australia. This meter is, as far as we are aware, the largest positive type station meter which has so far been built in any country, and will deal with 31 million c.ft. of coke oven gas per 24 hours. In spite of the fact that each of the rotating impellers weighs approximately 5 tons, the sensitiveness of the meter is such that it will be operated by the gas pressure at a differential of less than 1 in. water column, and the impellers may be set in motion by a push of the tip of one finger. The bearings are of the roller type housed in the end plates of the meter in such a way that they are easily accessible without any dismantling of the structure being necessary. The meter will be shipped in two separate packages, the maximum weight being about 20 tons, and the total weight of the meter will be 28 tons. Since Messrs. Holmes first placed this meter on the British market, over fifty large meters have been supplied for measuring coke oven gas, and approximately 150 are now in use as station meters in the British Empire, France, and Belgium.

Presidential Address of Mr. J. T. Spencer, of Weston-super-Mare.

Western Junior Gas Association, April 26.

Gas Drying and Oil Washing.

A gas-drying plant, by means of the calcium chloride process, was first put into operation at Taunton in June, 1926; and since that date upwards of 30 works have adopted this process for the removal of surplus water vapour from the gas as distributed from the works. In our own case, an order was placed with Messrs. W. C. Holmes & Co., Ltd., the makers of these plants, for a 2½-million c.ft. per diem plant in January, 1927; the gas was first treated in August, 1927, and the plant has therefore been continuously at work for two years and eight months.

The washer is divided into two sections each of six chambers, the first section containing the drying medium, calcium chloride, and the second section contains gas oil for the removal of naphthalene. The construction and general working of these plants are so well known that there is little that I can say which will be new. I can, however, enumerate a few of the benefits which are so far apparent and also give some information relating to one or two difficulties that we have had to deal with.

Main and service complaints have gradually been reduced and some comparative figures are as follows:

Year.	Total No.	Per 1000 Consumers.
1925	1564)	
1926	1295 - average 2230	263
1927	3832)	
1928	738	80
1929	212	22

We had 870 service complaints in June, 1927, whereas our maximum for any one month last year was 51. I may say that complete stoppages of the supply are now very rare, which could not be said of the complaints prior to the installation of this plant. During the extraordinarily cold weather of February, 1929, when for seven days the maximum temperature was 32° Fahr., our total complaints were 41—or 4·3 per 1000 consumers. During the same month we had only four house services and nine lamp services stopped as a result of water or frost out of a total of 8400 services throughout our area of supply.

Reduction in Syphon Pumping.

Our total number of syphons on the district is 536, and of these 512 are now dry. The wet syphons are gradually being reduced by repairing defects in our mains and services which allow water to enter from external sources.

I may say that the actual locating and repairing of these defects is not quite so simple as has been stated; for 11 out of the 24 wet syphons are apparently situated in ground which is waterlogged for a few months only, as in the summer period they are quite dry. Thus the time available for locating the points of infiltration is limited, as in the dry season any gas leaking from these defects is so small that detection is extremely difficult. Again, a defect in a 12 in. main which has recently been repaired necessitated observations and numerous tests extending over a period of months before we were able definitely to locate the defective section. This proved to be a length of main which passes under the main line railway inside a casing of 20 in. cast-iron pipe and at a depth of 5½ ft. As the railway traffic could not be suspended, the question of repair presented some difficulty; but it was eventually effected by cutting off the main at both ends of the casing, withdrawing the length of 12 in. main inside by means of a crab winch and replacing with a 12 in. welded steel tube.

Resaturation of the Gas.

As the gas passed through the holders this has been a difficulty we have been up against, and though it has gradually diminished so that the rise in dew-point is now only about 7° Fahr., yet this is higher than is experienced by most under-

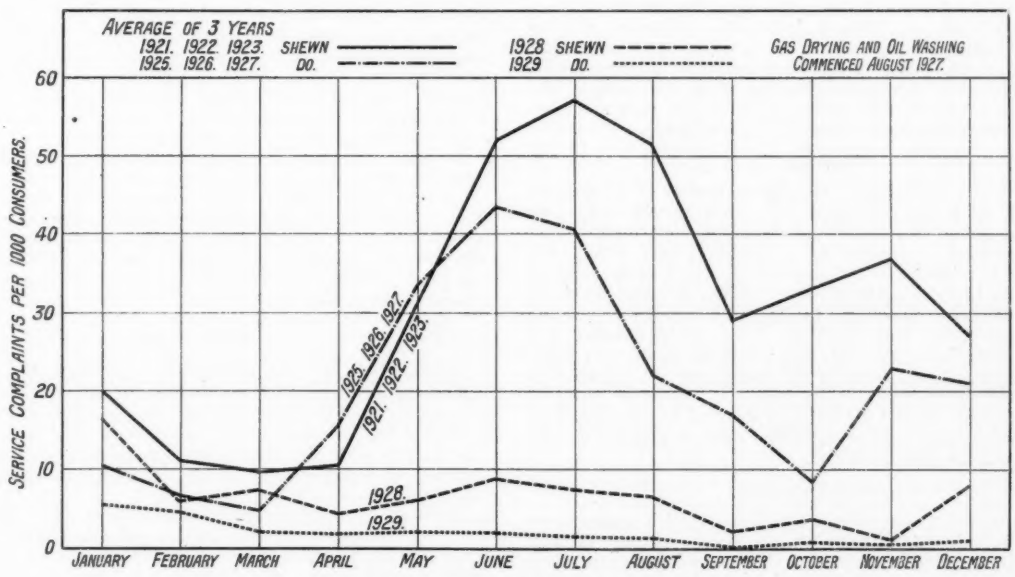


FIG. 1.—SERVICE COMPLAINTS.

takings who have a gas-drying plant in operation. A summary of our conditions and possible reasons for this amount of resaturation may be of interest. Our two main holders are timber-framed, the total quantity of timber structure above the oil film being approximately 1100 c.ft., with an exposed surface to the gas passing through the holders of 11,200 sq. ft. The long period during which this timber has been in contact with the water in the tank and with the saturated gas had, no doubt, completely saturated the timber, so that one probable cause of the increase in dew-point of the gas has been the evaporation of the moisture already present in this timber. That this is not the only cause of the trouble can be proved by calculating the amount of water that it is possible for 1100 c.ft. of timber to hold and comparing the amount that the gas has picked up in passing through the holder.

Another possible solution that has been considered is that of capillary attraction of the water from the tank below the oil film and up through the pores of the timber, acting much in the same way as a lamp wick. This timber consists of 152 posts, each being 6 in. by 6 in. pitch pine.

The constant rising and falling of the holder plates into the tank does no doubt expose wetted surfaces to the gas, but as this is common to all tank holders our conditions in this respect are not exceptional. The oil film on the surface of the water was also suspected, and after examination was increased from ¼ in. to ½ in., and has been maintained at that figure.

The inlet and outlet connections to our holders are not water-tight, and some infiltration takes place. This is apparently due to "drawn" joints in the cast-iron pipes caused by settlement of the foundations, which latter is confirmed by the fact that the top curbs of the holder tanks are out of level by as much as 4 in.

Though we have experienced considerable trouble due to the

gas-drying plant being situated on the inlet to the holders, which, as I have stated, is probably due to our local conditions, yet I still consider that there is a distinct advantage in drying the gas before entering the holder in that there is the ultimate saving due to the prevention of corrosion to the internal framing and sheets of the holders. External corrosion is fairly easily dealt with, but the inside has usually to take care of itself.

Again, the elimination of naphthalene from the gas at this point overcomes a frequent source of trouble in the inlet and outlet pipes of the holders. A certain amount of back-pressure would also have to be dealt with if the plant was situated after the holders, this being dependent on the capacity of the plant in relation to the maximum delivery of gas to the town.

Rust.

The possibility of trouble from dry rust was anticipated, but has not materialized to any important extent. Precautions were taken to minimize possible trouble by retaining an oil atomizer which was at work before the gas-drying plant was installed, and, in addition, all new service pipes have been internally coated with oil and latterly with red oxide paint.

This internal coating of our service pipes and steel tubes is also a protection against the formation of iron carbonyl, which we have experienced in a few cases of service pipes having a small flow of gas passing through them. The trouble was confined to our street lamps, particularly those which are centrally suspended and have a long length of horizontal supply pipe. These lamps reduce at midnight from eight burners to two, and favourable conditions were probably produced from midnight until sunrise. The effect was in some cases to form a dark red stain or film around the mantles near the mantle ring, in other cases fine particles of iron rust dropped inside the mantles. Iron rust was also found in the nozzles and superheaters. The light from the mantles was very much reduced, and they had to be immediately replaced.

Meters.

The effect of gas drying in relation to meters is being carefully noted, as it is anticipated that some considerable time must elapse before any definite statement can be made. One or two encouraging features have, however, been found, the first of which relates to a comparison for the last three years of the quarterly tests made of meters which are brought in on reports of defective working. Of the total number tested and found incorrect, we had, in 1927, 38·2 p.ct. passing unregistered gas; in 1928, 15·4 p.ct.; and in 1929, 11·9 p.ct., Again, the last report of one of the meter makers, to whom a portion of our meters are sent for repair, is worthy of mention, as in it they state that "we notice a gradual but very decided improvement in the condition of your meters compared with what it was some time ago."

Gummy Deposits.

Some little trouble has been experienced with gummy deposits on the valves of our station governors, which prevented the valves from opening freely after times of minimum demand. A few instances of similar deposits in the injectors of gas fires were reported. Gummy deposits have been reported from some towns where a percentage of carburetted water gas is distributed, and have been found to consist of polymerized styrene and indene obtained from the gas oil used. In our case, these deposits were not met with prior to the installation of the gas-drying plant, so it is reasonable to assume that the oil washing for naphthalene extraction, or possibly the film of oil on the water in the holders, is the source of the trouble.

Unaccounted-for Gas.

The unaccounted-for gas was expected to increase from the time that gas drying was commenced; but actually the percentage has decreased, and the total quantity unaccounted for is no more than it was in 1916, notwithstanding an increased gas output of 61 p.ct.

Year.	Percentage.	Average for Three Years.
1924	7·40	
1925	6·93	7·32 p.ct.
1926	7·62	
1927	5·29	
1928	4·49	4·75 ,,
1929	4·48	

Cost of Operation.

The cost of operation for the combined plant, including interest on capital expenditure and depreciation, works out at 0·32d. per 1000 c.ft., or 0·067d. per therm.

I think I have shown that considerable savings are being effected, which it is obviously too early to estimate in terms of £ s. d., but what is far more important to my mind is the improved service to the consumer which is of inestimable value.

Water Boring.

Our experience in a search for water for the usual works processes of steam raising, gas cooling, coke quenching, &c., may prove of some interest. A portion of the water required for these purposes is procured during the wet seasons from the Rhynes bordering the works, but as these merely obtain their water by drainage from the adjoining land, the major part of our needs has to be obtained from the town supply. This cost is considerable, and amounted to £350 last year. With the object of reducing this cost it was decided to sink a borehole, and, if the necessary water was available and the quality satisfactory, to fix up the requisite pumping plant, &c. I may say here that at various times we have had the services of water diviners who have indicated spots where water could, in their opinion, be obtained, but we have found that no two diviners agreed on the same spot.

Eventually, artesian well engineers of repute were engaged, and the boring commenced in July, 1928, the rotary method of core boring with steel cutting teeth being used. An 8 in. diameter bore was decided upon, which it was estimated would give a supply of from 2000 to 4000 gallons of water per hour. Eminent geologists who were consulted stated that alluvial deposits would extend to a depth of 100 ft., the Keuper marls for a further 50 ft., and that we should touch limestone at about 150 ft. from the surface. Boring into the limestone for a distance of 100 ft. was provided for, making the total estimated depth of borehole to be 250 ft.

The actual depth at which limestone was struck was 795 ft., or 645 ft. beyond the estimated depth of 150 ft. At a depth of 180 ft., water appeared in the borehole, and the quantity was such that after continuous pumping the level was maintained at 10 ft. from the surface. An analysis of this water proved, however, that the quality was distinctly unsatisfactory, and additional lining tubes were fixed so as to exclude this polluted water, the contamination of which was apparently of sewage or decayed vegetable origin.

It was anticipated that a water-bearing strata would be found in the dolomitic conglomerate, but this, when met with at 785 ft., was found to be intermixed with marl and out of the question as a water bearing strata. Though the boring was continued to 838 ft., being 43 ft. into the limestone, water of sufficient quantity and quality was not obtained, and, on the advice of their geological experts, the Directors decided to abandon the work.

Coke Sales.

I think it is still not sufficiently recognized that the sale of coke is almost as important as the sale of gas. The more we receive for our coke, the cheaper we can afford to sell our gas, and this is a point that our salesmen should have impressed upon them more and more, as I am afraid that many of them consider that gas is the only fuel for which their selling efforts are required.

Weston, being purely a residential town and holiday resort, our local market is limited to users of coke for domestic purposes. The development that has taken place in the conversion of large houses into flats does not conduce to the sale of coke, as we find that the occupants of flats are good customers for gas but not for any solid fuel.

As it was realized that unbroken coke did not meet the requirements of our customers, a coke cutting and grading plant was installed in 1922, with the result that our local sales have not only been retained but have increased by 28 p.ct. The sale of coke nuts has increased from 280 tons in 1922 to 3700 tons in 1929. Thus we are creating a regular market for our coke in place of the fluctuating one of rail-borne coke, and we are also obtaining an increased revenue due to the higher rate per ton of coke sold locally. In the development of this policy we have undertaken the bagging and delivering of coke direct to the customer, thereby keeping in touch with the actual consumer and also ensuring prompt attention to his requirements.

The Heating Load.

The consumption of gas for heating purposes in Weston has developed rapidly during the past ten years, as is indicated on the accompanying chart. The curve for 1919 was approximating more to the ideal straight line, whereas the 1929 curve shows that the rate of increase is greater in the winter months than in the summer period, the ratio being in the region of 3 to 1. This fact is undoubtedly due to the increased use of gas for heating, the number of gas fires and radiators in use in 1919 being 3162, whereas at the end of 1929 the number was 9517—an increase of 6355.

Also plotted on this chart is the average weekly air temperatures for the winter months; from which it is interesting to observe that the temperature curve follows very closely the "gas output" curve, showing the effect of temperature on the load.

That the lighting load is still an important factor can be seen by the distinct drop at the commencement of summer

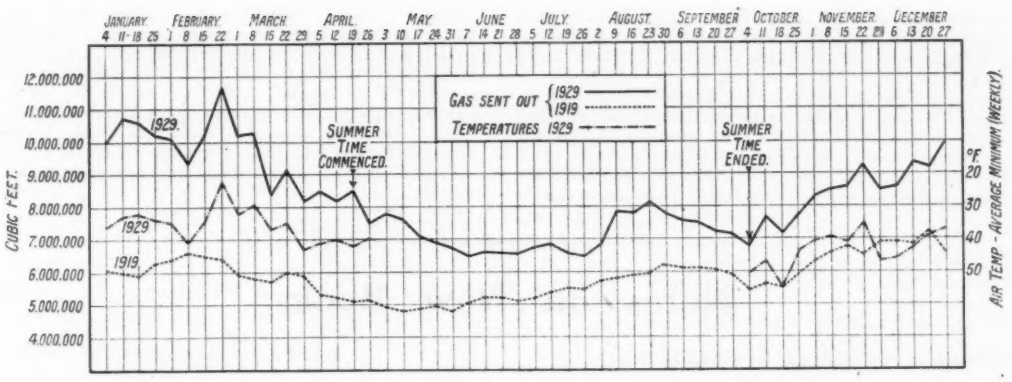


FIG. 2.—GAS SENT OUT WEEKLY.

time in April and a corresponding rise at the end of summer time in October.

The deviation from the straight line of 1919 is, from a gas engineer's point of view, to be deplored, as it means that the works plant must be capable of meeting these winter peak loads, and consequently there is a larger proportion of idle plant in the summer months. The plant must also be particularly flexible, as the same heating load can rapidly increase by 20 to 25 p.ct. with a sudden drop in the air temperature such as was experienced in February, 1929.

The Lighting Load.

I have referred to the lighting load as being a factor not to be lost sight of, and though it is the policy of successive Governments to boost electricity, yet I am sure you will agree that the greater effort which is now being directed both in retaining and increasing this load is, in a large number of cases, long overdue.

The chief attraction that electric light has to offer is that of convenient switch control, and in this respect gas lighting is, at the present time, at a disadvantage. The positive switch, that we had the opportunity of seeing at the maker's works in December last, is certainly a decided improvement on previous types, but this still has to rely on a by-pass as a means of ignition. I was particularly interested in a reference to a new distance control device made by Mr. F. J. Gould in a paper which he read at the Joint Gas Conference at Birmingham on Feb. 18 last. He stated that this device, which will shortly be on the market, will control the gas burner in the same way that the electric lamp is controlled, and that this will be carried out without the aid of a by-pass. A reliable switch of this nature is what the gas industry has been in need of for some considerable time, and a solution of this problem is eagerly awaited. If the expectations engendered by Mr. Gould materialize, then our salesman's task will be simplified, as the only real obstacle to the lighting business is the question of switch control.

In our case, domestic lighting is cared for by a maintenance system whereby consumers' burners are periodically cleaned and adjusted free of cost, a charge being made for replacements only. In the working class houses erected by the local authorities we are now installing gas for all purposes including lighting.

Inside and outside shop lighting is not neglected and in the latter case considerable progress has been made, as shown by a total of 360 outside shop lamps on hire.

Public Lighting.

The position of gas in relation to public lighting can undoubtedly be maintained by most undertakings provided the competition is fair and open. In Weston special attention is given to public lighting, and the whole of the town, with the exception of seven streets, is lit by gas under contract with the Council. The system was completely modernized seven years ago, when investigations were made with the object of obtaining the highest efficiency at the lowest cost. Most undertakings now supply gas of uniform quality, but it is still not possible to adopt an ideal burner, where the gas and air supplies would both be fixed, owing to varying mixtures. What has been done is to fix the gas consumption at each burner by means of a fixed nipple, according to the average evening pressure available, so that the lamp attendant has only the air supply to adjust. This we consider far preferable to the use of a gas adjuster, whereby both the gas and air supplies are left to the judgment of the attendant. Such adjustments are made during the day when the pressure available at the lamp may vary considerably from that during lighting hours, nor is sufficient time usually allowed for the superheater to function efficiently. The sizes of these fixed nipples vary for every 5-tenths pressure and for consumptions to suit the number of burners.

Square lanterns were adopted as the most suitable for smaller units—*i.e.*, up to 400 c.p.—and were fitted with cluster burners with No. 1 nozzles.

Our by-passes consist of "Godson" heads packed with asbestos fibre, and have an average consumption of $\frac{1}{8}$ c.ft. per hour. Care and some experience is necessary in the adjustment of this type of by-pass to ensure that the flame is burning within the fibre. It is important that this consumption should be kept as low as possible, seeing that they are burning all the year round, provided that their reliability is not impaired. The by-pass failures for the past twelve months work out at 0·24 p.ct. per day, notwithstanding that we still have a number of lanterns which are old and not windproof.

The size of mantle necessary to give the highest efficiency with the gas consumptions controlled by the fixed nipple was ascertained and found to be for No. 1 bijou mantle 29 mm. in height over all by 23 mm. diameter. Particular care is taken in checking supplies to ensure that they conform to these sizes, as it is possible to get wide variations from the same source, with a consequent loss in efficiency. The total mantle consumption for the last twelve months works out at 1·59 mantles per nozzle, which includes all mantles used by fitters. The mantles used by the lamp attendants only on the 2 to 6 burner lamps is 1·07 per nozzle per annum.

All the lamps are operated by clockwork controllers which will run for a period of fifteen days between winding. The cleaning rounds, however, are arranged so that the clocks are re-wound every ten days, which, apart from the advantage of more frequent cleaning, is considered the maximum period between setting owing to the rapid changes in the lighting times at certain seasons of the year. The clock failures last year amounted to 0·33 p.ct. per day, or 1·4 per 1000 operations, which is rather higher than previous years due to most of the controllers having been in continuous use for seven years. A record of each individual lamp is kept showing the number of mantles used and details of failures due to by-passes, controllers, &c.

A scheme of grading of roads has been carried out, so that the standard of lighting in conjunction with the class of road has been carefully fixed. It is to be noted, however, that the standard of lighting tends to become higher year by year, and this is particularly so as regards the more important thoroughfares.

Obsolete Appliances.

While on the subject of distribution, the question of obsolete appliances calls for comment. It is, in my opinion, the duty of all gas undertakings to offer generous allowances for obsolete apparatus, particularly gas fires, in part exchange to consumers. The gas fire in its earliest forms was denounced by the medical man as unhygienic, which was due to its design being such that the products of combustion were not completely eliminated from the room, and, in addition, convected heat, which produces a feeling of dryness, was chiefly made use of instead of radiant heat, which is now largely utilized. The modern gas fire of to-day is a highly scientific piece of apparatus; it ventilates the air of a room equally as well as a coal fire; it does not dry the air of the room, and is used and recommended by the medical profession. Why then do we find, even in public offices, these earlier forms of gas fires still in use? It is possible to see water in some receptacle or other in front of some of these fires. Gas undertakings should, in my opinion, give immediate attention to this matter and endeavour to locate and to dispose of these antiquated appliances, to the mutual advantage of the undertaking and of the consumer.

Another minor point in dealing with appliances is the extended use that is made of the flexible tube connection with rubber ends. This form of connection is sold and fixed in considerable quantities by most gas undertakings. It is admitted that a flexible connection in some form or other is necessary in a few instances for portable appliances, but it is frequently used for fixed apparatus—*i.e.*, gas fires, radiators, &c. The defects in this type of connection are mainly due to the rubber ends. The rubber does not make a good joint with

the flex, and the wax or other composition, which is used as a filling between the two, readily cracks and tends to produce a leaky joint. The quality of the rubber is often at fault and a split appears in the rubber ends Again, the life of the flex is particularly short, and its condition is affected by moisture. Consumers are frequently inconvenienced through defects developing, often at the most inopportune moment, when the particular appliance is required. If it is necessary to fix a flexible tube connection, though, as I have stated, these are fixed in numerous instances where a screwed pipe connection is called for, then I maintain it is in the gas company's interest to fix the safer types which are available. The danger is confirmed by the report of the Departmental Committee on Deaths from Gas Poisoning, where no less than 7 p.ct. of the total number of accidental deaths are accounted for by the use of flexible tubing. This percentage would be appreciably higher, due to the total number of accidental deaths being lower, if it was not for the merciful view often taken by a jury in giving a verdict of accidental death in place of the more accurate one of suicide.

Notes on New Books.

PROGRESS OF APPLIED CHEMISTRY.*

The 1929 edition of this book, invaluable to those desirous of keeping abreast with the development of science in the field of industry, in no way falls behind the high standard set by its predecessors. As before, the volume is edited by Mr. T. F. Burton; while those sections of particular interest to the gas industry—"General, Plant, and Machinery," "Fuel," "Gas, Carbonization, Tar, and Tar Products," and "Refractories, Ceramics, and Cements"—are contributed respectively by Mr. R. Edgeworth-Johnstone, Dr. J. G. King, Mr. H. Hollings and Mr. W. A. Voss, and Mr. W. C. Hancock.

"The Progress of Applied Chemistry" is, of course, a résumé of the outstanding literature of the year; it is in itself a review, not an expression of opinion, and it would be wholly out of place to attempt to review a summary such as this. In this regard suffice it to say that, as far as the carbonizing industries are concerned the matter and references have been chosen with nice discrimination. Inevitably there is a certain degree of overlapping in the sections on fuel and on gas and carbonization, though the point of view from which the subjects are attacked is different.

Dr. King devotes considerable space to coal cleaning, mentioning the growing popularity of the dry-cleaning processes, and recent developments of the Lessing plant, which have been described fully in the "Journal." He also records the work of E. Audibert in regard to the choice of coal for carbonization. Audibert's investigations on the fluidity of coals in the plastic state, and the structure of the resulting coke, have given a lead which many other investigators are now following. The importance of such work lies on the more efficient utilization of all types of coal; and the limitation of choice to strongly caking coals for coke manufacture is now definitely a thing of the past.

On the question of coke testing, Dr. King observes that success does not yet seem to have been achieved in the correlation to industrial values of the data obtained by the examination of coke samples in the laboratory. Tests such as the shatter test and trommel tests were designed to provide a measure of the resistance of the coke to handling, abrasion, and load in metallurgical processes, and it is only by prolonged obervation of the behaviour of known cokes in such processes that tests alone will ever achieve a practical value. In regard to the shatter test, our readers will recollect that the "Journal" for April 9 gave the standard test adopted and advocated by the Midland, Northern, and Scottish Coke Research Committees.

Mr. Hollings and Mr. Voss record the visit of the members of the Institute of Fuel to four low-temperature carbonization plants installed in London gas-works. They observe that a significant feature of the general discussion which followed this visit was that it concentrated on three factors—capital charge, ground space requirements, and labour costs—which it is now realized must be the criteria of comparison between low-temperature carbonization processes and the older established high-temperature systems making gas. In both sections much attention is paid to the important work undertaken jointly by the Institution of Gas Engineers and the University of Leeds.

Messrs. C. J. P. Bateson, H. M. Broadhurst, and A. Williams, in the section on "Acids, Alkalis, and Salts," record the novel idea, involving the simultaneous production of sulphuric and nitric acids as bye-products from gas-works, which has been patented by the I.G. Farbenindustrie. This consists of the oxidation and absorption of gases containing sulphur dioxide and ammonia. The latter is oxidized catalytically to oxides of nitrogen. The mixed gases then pass up towers where they meet nitrosylsulphuric acid and where the sulphur dioxide is largely converted into sulphuric acid, the nitrogen oxides being expelled from the acid. The latter, after passing through an oxidation chamber, are absorbed in sulphuric acid, from which they may be expelled subsequently by heat, and recovered.

* Annual Reports of the Society of Chemical Industry on the Progress of Applied Chemistry, 1929—Vol. XIV. Price 7s. 6d. to members of the Society; 12s. 6d. to non-members.

WATER ENGINEERING IN 1929.*

The year 1929 has been a memorable one to water engineers as a period of immense difficulty, on account of the severe frosts, with unprecedented toll of burst pipes, followed by a long period of drought, and succeeded by two months of excessive rain and floods. The 1930 edition of the "Water Engineer's Handbook and Directory" contains a full and interesting survey of this abnormal period from a water engineer's point of view. On Feb. 10, states the opening of a review of 1929, the most severe spell of cold weather known for 103 years enveloped Central Europe, including Great Britain. This section goes on to deal with the difficulties experienced both during this and the subsequent period of shortage of supply. Further sections embrace water supply from the Government standpoint, including paragraphs on river pollution, rural supplies, land drainage schemes, and purification of water in swimming baths. In this latter section it is stated that artificial bathing pools should always be equipped with adequate continuous purification plants, and the period for complete circulation or "turnover" should be short—*i.e.*, for covered baths up to 150,000 gallons capacity it should not be more than four hours. There is also a section on the Reservoirs (Safety Provisions) Bill, followed by a review of engineering progress in particular districts throughout the country. Water bye-laws and regulations are also given attention, while among the new features introduced in the 1930 edition is a comprehensive section on pumps and pumping; the subject of purification and filtration has been adequately dealt with.

There are the usual useful data on various types of pipes suitable for water distribution purposes, together with tables of their weights, melting points, and specific gravity; while included also is a section on rainfall, including a table of serial values of monthly and annual general rainfall, expressed as percentages of monthly and annual averages for 1881 to 1929.

The whole of the technical matter has been thoroughly revised and extended by the addition of further data suggested by well-known engineers as being useful for reference. The directory and waterworks statistics have been completely revised and extended, more than 1000 authorities not represented in the last edition now being included. In this respect the directory has become of even greater value to overseas water engineers in that there are now full particulars of the water supplies of Canada, Australia, South Africa, New Zealand, and Tasmania. The list of water engineers, which was so much appreciated in the last edition, has been greatly extended by the inclusion of assistant, resident, and deputy engineers.

The remarkable reception given to the first edition of this work was most encouraging and amply justified the anticipation that a handbook of this character was needed; and there is no doubt that the current edition will be of very material service to water engineers both in this country and in the dominions concerned.

* "The Water Engineer's Handbook and Directory, 1930." Published by "Water and Water Engineering" (Proprietors: The Colliery Guardian Company, Ltd.); 30-31, Furnival Street, E.C. 4. Price 8s. 6d. (postage 6d.).

Education for Commerce.—Mr. F. W. Goodenough, C.B.E., President of the Incorporated Sales Managers' Association, spoke on "Education for Commerce" at the annual dinner of the Cambridge Chamber of Commerce on April 25. He also dealt with the work of the Committee on Education for Salesmanship, of which he is Chairman. He said that from the outset the Committee had understood by "salesmanship" not merely nor mainly the work of the outdoor commercial traveller and of the indoor salesman, nor even of the sales manager controlling them, but the whole science and art of finding, catering for, and developing markets for the products and services of our manufacturers. Education for salesmanship was education for commerce on its creative, organizing, and executive sides. The justification for laying special emphasis at the present time on the importance of efficient salesmanship was the fact that we had lost and were losing ground in the markets of the world.

Woodall-Duckham Intermittent Vertical Retort Installation at the Waddon Works of the Croydon Gas Company.

By G. W. G. Tatam.

[Extracted from the "Croydon Co-Partner."]

Until 1928 the Engineers of the Croydon Gas Company had given preference to the horizontal system of retorting. The rapidly increasing requirements of our district, and the small area of ground available for extension at the Waddon Works, made it necessary to find means for producing large volumes of gas on relatively small areas. Carburetted water gas in part meets the case, but oil prices, among other important considerations, limit its use.

Carbonization of coal in large masses and in vertical ovens seemed to be the solution of our problem for the moment. Two systems were available—viz., the continuous and the intermittent. The intermittent vertical oven system was the one chosen, on account of its simplicity of operation, absence of intricate charging and discharging mechanism, and the fact that Durham coals could be carbonized efficiently.

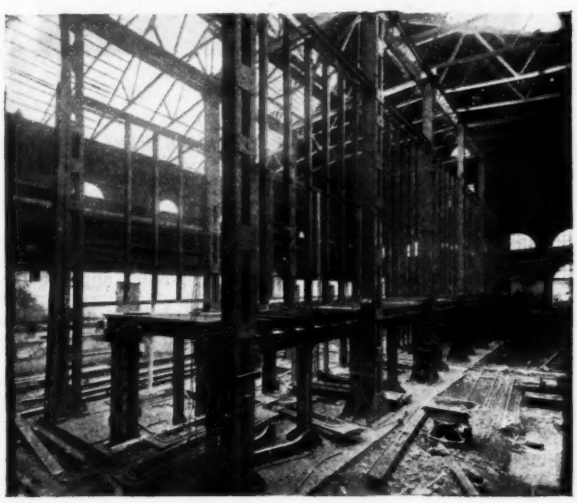


Fig. 1.

Two types of intermittent systems were examined, the Woodall-Duckham Stettiner setting and the Pintsch Otto setting. It was decided that the former fulfilled our requirements; and on April 11, 1928, the demolition of the old horizontal settings in No. 3 Retort House commenced to make way for the new verticals, which were put to work on Nov. 27, 1929.

This setting of six benches, each containing six vertical ovens or retorts, was designed to carbonize 250 tons of coal per 24 hours and produce 3,520,000 c.ft. of gas of 550 B.Th.U. per c.ft. gross, the coke production after allowing for fuel fed to producers being about 130 tons.

The foundation upon which the settings and their steel bracing stand is of massed concrete 5 ft. 9 in. thick. Upon this foundation was erected the main stanchions and buckstays, into which the setting is built. Fig. 1 shows the almost completed bench bracing.

On the centre line between the two outer rows of bracing is shown a line of short stanchions with horizontal joists or girders carried on their tops, and from these other horizontal girders carrying back to the row of outer bracings. The ovens are constructed on this step.

The producers, with their attendant waste gas and secondary air passages, are built from floor level between the outer row of main bracing, and the short stanchions carrying the horizontal girders upon which the ovens are built.

The steel bracing is further tied together by horizontal tie rods passing from one side of the main bracing to the other. The holes through which the rods pass are clearly defined in fig. 1.

When the buttress and dividing wall are being built these rods are laid in recesses formed in this brickwork and, where subjected to heat, are formed hollow, so that they may be water cooled. The purpose of this bracing is to direct and in part resist the expansion of the brickwork when heated.

The producers are fitted with step grates, and the three doors and door frames giving access to each producer for clinkering have machined faces. The producers are constructed of Stourbridge firebrick, with an ash pan of Staffordshire blue brick, and extend the whole height of the setting, the space above the fire zone forming an admirable storage for the producer coke.

The ovens are constructed of silica panel bricks, tongued and grooved to ensure a perfectly tight joint when set with a thin silica cement mortar. The ovens are not rectangular about the vertical axis, being 4½ in. wider at the bottom than the top, to facilitate the downward movement of the coke on discharge. The dimensions of the ovens are—top, 9 ft. 7½ in. by 8 in.; bottom, 10 ft. by 12½ in.; depth over-all, 21 ft. 4½ in.; depth of coal space, 17 ft. 9 in., with a gross coal capacity of 149 c.ft. when hot.

The first step in erection of the ovens was to build the two end buttress walls and the five inside dividing walls, seven in all, thus providing six equal spaces into which the six settings, each of six ovens, are built. These walls were not carried to their full height at once, but were carried up somewhat in advance of the rest of the setting.

The producers with waste gas and secondary air flues on either side were started from floor level and carried up to the top of the horizontal girders on which the ovens are erected, when the two units were taken up together.

One of the most noticeable features of construction was the provision made for expansion within the bracing; both chambers and producer structures were kept ⅝ in. apart and from the dividing walls and back walls. It was found, however, that, although provision had been left for filling these spaces, after heats were raised, very little had to be done, so well were the allowances calculated.

The ovens were started off cast-iron plates placed on the horizontal girders shown in fig. 1, and to these plates are bolted the bottom coke discharge door-frames and doors. These doors and their attachments are shown in fig. 2.

The ovens are built in the form of long tapered boxes, one vertical end butting on to the back of the producer back-wall, the other on to the setting back-wall, so that no heating gases can pass round the ends of the ovens after the expansion due to heating has taken place. The ovens are separated one from the other by heating flues 24 in. wide. Openings from the producers were carried into these flues, through which the producer gas can pass and meet the heated secondary air required to burn the producer gas. The flame thus generated travels through a circuitous course up the flues to heat the ovens, and finally passes to the waste gas flues, situated on either side of the producer, and thence to the waste-heat boilers.

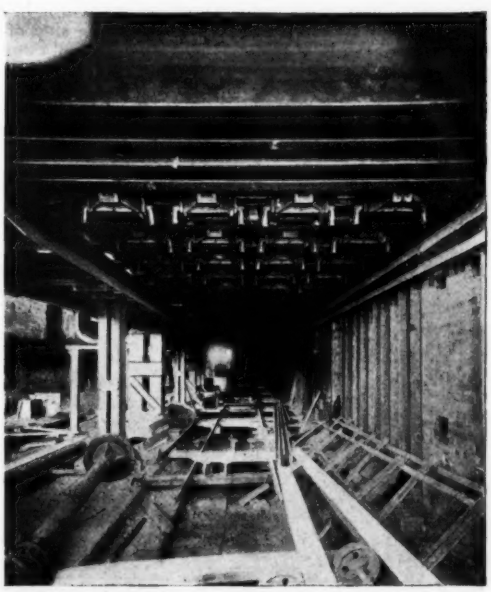


Fig. 2.

When the producers and ovens had reached a height of 20 ft.

Fig. 3.

Fig. 4.

above the horizontal girders, the heating flues were covered down with fireclay tiles, and connected to the waste gas flues which had been carried up on either side of the producer. Charging openings and gas off-take openings were formed at the tops of the ovens, and cast-iron doors and gas off-take pipes fitted to their respective openings. Fig. 3 gives a general view of the charging floor.

The gas off-take pipes with their associated sealing chambers are connected to the crude gas main which conveys the gas to the condensers and purifying plant. The charging floor is paved with heat insulating bricks, and tracks are laid on it for travelling the oven-charging coal, and the producer-charging coke, wagons.

The bottom door-frames are bolted to the foundation plates off which the ovens are built, and have cast in them a channel and gas take-off, through which excess gas pressure, which always appears between the sixth and seventh hour at the oven bottom, can escape to an external **U**-shaped hydraulic main shown at the lower left-hand part of the structure in fig. 4. The bottom frames have hinge lugs cast on one side of them, while the doors have lugs cast on their centre line. Four hinge arms are attached at their centres to the door lugs by eccentric bolts. One end of the hinge arm is connected to the door-frame by a steel shaft passing through the lugs on the door-frame. The other end of the hinge arm is free to engage a catch on the opposite side of the door-frame.

The hinge arms are keyed to this shaft so that when the shaft rotates the door opens or closes on the hinges. The shaft extends outside the setting and has attached near its end one-half of a dog clutch, free to slide along a key fitted in the shaft. The other half of this clutch is connected to a toothed wheel engaging a rack actuated by a hydraulic ram. (See fig. 4.) This clutch is a safety device, and the two halves can only be engaged by a special key. When this key is withdrawn the clutch becomes inoperative, so that the hydraulic ram may actuate the rack and through it the toothed wheel; but no motion is given to the hinge spindle, and the door cannot open. On the opposite side of the door-frame, catches are attached which slip over the free ends of the hinge arms and hold the door fast to its seat; or, when detached from the end of the hinge arms, allow the door to be opened.

Coal is unloaded for the plant by a Bennis rotary wagon tippler. The receiving hopper discharges through two bottom chutes into a chart drag-bar conveyor delivering the coal into two 24 in. by 24 in. Jeffrey single-roll breakers, where any lumps are broken to pass through 1½ in. screen. Each breaker is capable of dealing with 60 tons of coal per hour. The breakers deliver to the boots of two Babcock & Wilcox roller-chain bucket elevators, each capable of raising 60 tons of coal per hour, and delivering to a storage hopper of approximately 500 tons capacity. This hopper is so divided that 20 tons of breeze can also be stored at one end. The discharging doors of this hopper are shown in fig. 3. The hopper is erected over one end of the top or charging floor, and is supported on four main stanchions of the bracing. Discharge doors are fitted to the bottom of this hopper, through which coal and breeze are fed into the oven charging wagon. This skip is electrically propelled over rails laid on the charging floor and is so divided

Fig. 5.

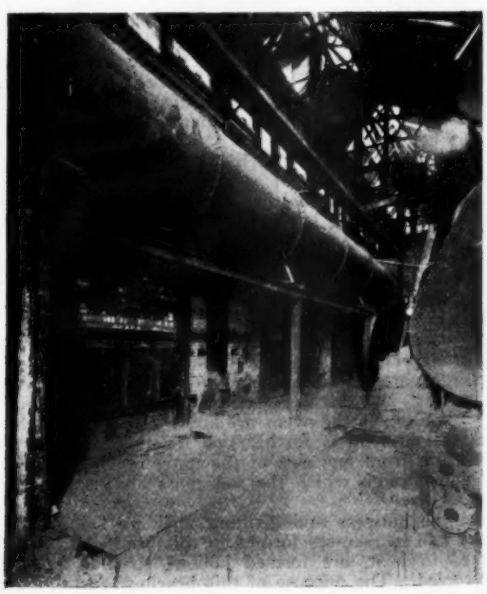


Fig. 6.

that both coal and breeze can be conveyed to the ovens at one time, but separately discharged. Its coal capacity is 3·75 tons.

On this charging floor are also rails for the electrically-driven producer filling coke wagon which conveys fuel from the outside producer storage hopper to the producers. The contents of this skip are automatically weighed at each filling by an Avery automatic weighbridge situated under the producer storage hopper.

On the ground floor, and situated under the bottom discharging doors of the ovens is the track on which the hot coke skip chassis runs. Wire rope haulage positions this skip centrally under the oven to be discharged, and afterwards conveys the 2·5 tons of hot coke to the quenching tower, where it is cooled by water spray and afterwards hauled to the foot of the automatic electric telpher.

The quenching tower is 98 ft. high. The lower portion is of brickwork and of such dimensions as conveniently to accommodate the hot coke wagon during quenching operations. The upper portion of 86 ft. is built up of light angle sections framed on the inside with wood. This acts as a chimney to carry off the steam generated during quenching. The quenching sprays are situated in the top of the brickwork portion of the tower and are supplied from an overhead tank of 1200 gallons capacity. Water is pumped from a circulating tank to the quenching tank by an electrically-driven two-stage rotary pump. The motor starter of this pump is float-controlled from the quenching tank. When the quenching tank is empty a float-controlled plug closes the outlet and trips a switch in the motor starter circuit. When the tank is full this switch opens the circuit and the pump stops. No water can leave the quenching tank until the float plug is again raised.

On the producer side of the ground-floor are two horizontal multi-tubular waste-heat boilers, made by Ruston & Hornsby, of Lincoln, with their attendant boiler-feed pumps, waste-steam feed water heater and feed tank. Fig. 5 gives a view of a boiler top with its flue to chimney. Each boiler has a heating surface of 4145 sq. ft. and will produce 11,000 lbs. of steam per hour when 11,500 c.ft. per hour of waste gases at 600° C. are passed through them.

The hot waste gases are conducted from the settings through a circular firebrick-lined steel duct (fig. 6) to a collecting chamber at the base of the main chimney, but separated from it by a damper. From this chamber the hot waste gases are drawn through the boiler tubes by two steam-driven turbo fans situated at the boiler outlet.

The cooling water circulated through the tie bars, and all boiler-feed water is softened in a " Boby Azed " base-exchange plant, consisting of a sand filter and two reaction vessels, each of which has a softening capacity of 8000 gallons when water of 22 grains per gallon hardness is passed at the rate of 1000 gallons per hour.

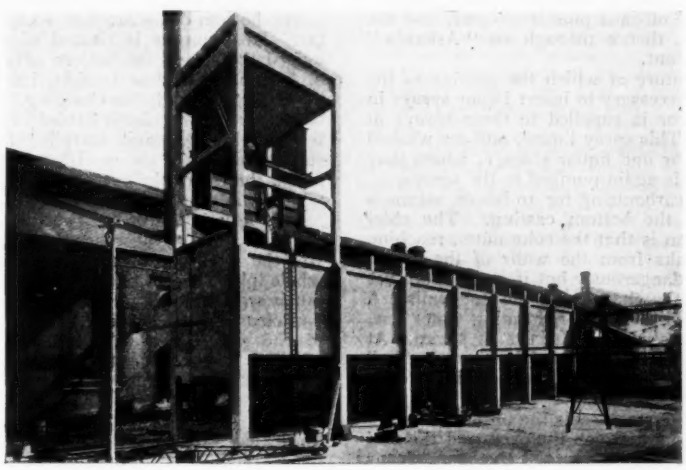


FIG. 7.

The automatic electric telpher was made by Strachan & Henshaw, of Bristol.

The coke handling plant associated with the telpherage is shown in figs. 7 and 8. This structure is built over one of our main rail tracks enabling engine and trucks to pass underneath for loading. The hoppers and supports are constructed of reinforced concrete and have a working capacity of 600 tons. When the coke skip has been travelled over the receiving hopper, it is " dumped," and the coke is discharged from the hopper bottom door into a Ross chain feed.

The feeder delivers into the mouth of a Cort's high-speed coke cutter. From the outlet of the cutter depend two chutes directing the coke on to the two lines of Zimmer shaking screens. The hopper bottom inclines from the centre line and from the sides to form delivery necks, to which are attached loading chutes. One set for loading direct into rail trucks, the other set for loading into sacks or lorries. Screen discharge of the large coke can be made on to the conveyor carrying coke to the carburetted water gas plant.

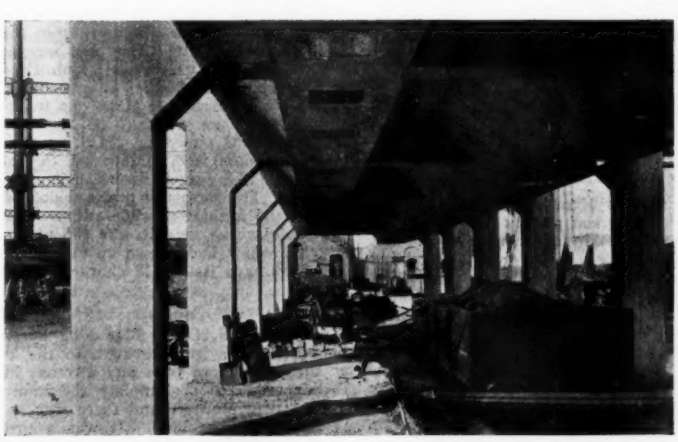


FIG. 8.

The following is a brief description of the daily routine of gas-making.

Coal is delivered from the Bennis tippler into the drag bar conveyor feeding the Jeffrey breakers. From these breakers it is elevated by the Babcock-Wilcox conveyor and delivered to the storage hopper situated above the charging floor. From the bottom discharge doors of this hopper it is delivered into the coal charging wagon. A small charge of breeze has also to

be delivered from the overhead hoppers into the breeze division of this charging wagon. The top charging door of the oven being open, the coal charging wagon is travelled and positioned so that the delivery chutes, on being lowered, enter the oven opening.

The bottom discharging door of the oven is shut, and on to this is dropped from the charging wagon a pad of coke breeze. This pad is for the purpose of keeping the bottom of the charge open to allow the gas access during pressure periods to the bottom offtakes. This breeze pad is 12 in. thick.

Immediately the breeze pad has been dropped the coal is charged into the oven, which holds from 3½ to 3¾ tons of coal. The charging wagon then returns to the storage hoppers for a further charge of coal. The charging doors are closed, the seal in the sealing chamber of the off-take pipe is lowered, and the gas passes to the foul main, thence through an "Askania" governor to the condensing plant.

Owing to the high temperature at which the gas leaves the top of the ovens, it is found necessary to insert liquor sprays in the hot gas mains; and liquor is supplied to these sprays at 30 lbs. per sq. in. pressure. This spray liquor, and tar washed from the gas, return to the tar and liquor storage, where they are separated, and the liquor is again pumped to the sprays.

After the charge has been carbonizing for 10 hours, steam is admitted to the annulus in the bottom casting. The chief reason for admitting the steam is that the coke mass, reaching complete carbonization, shrinks from the walls of the ovens, and the walls would become dangerously hot if steam were not injected to pass up between the charge and the hot walls. A portion of this steam reacts with the coke, forming water gas. Strict precautions must be observed in the use of steam. At the termination of the twelfth hour the coal has given off all its volatile constituents in the form of gas, tar, and liquor, and the residual coke is ready for discharging.

The operator on the charging stage seals the offtake, opens a cleaning cap on the offtake pipe between the oven and the seal chamber. He then opens the two top doors of the oven, cleans them, and also the gas offtake pipe and the bottom of the seal chamber. Having finished these top operations he signals to the bottom operator that he is ready, and that the charge of coke may be discharged.

The bottom operator then slacks off the bottom door, by loosening the eccentric bolts, and signals for the hot coke skip to be hauled into position. This being done, he places the key in the dog-clutch operating the bottom door hinge-shaft, puts pressure on the hydraulic ram to maintain the doors in their closed position while he looses off the catches from the ends of the four hinge levers. On reversing the pressure on the hydraulic ram, the door quietly opens and allows the 2½ tons of coke to fall in one mass into the hot coke skip, which is at once hauled away to its position under the quenching tower, where it is sprayed with about 700 gallons of water to cool the coke.

The bottom doors are now scraped and thoroughly cleaned of tar. The annulus is cleared of any breeze which may have lodged there, and the bottom offtake pipes are cleared of pitch or breeze. The door is shut, latched, and tightened, and the oven is again ready for charging.

The quenched coke is hauled to the lifting position under the telpher, hoisted, and travelled to either the producer coke storage hopper or the receiving hopper. From this hopper it is fed to the Cort coke cutter and then on to the Zimmer screens, where it is graded.

This description of the routine would be incomplete without some mention of the other duties carried out by the operators. Not the least among the several duties is that of keeping the whole plant clean. This entails scraping of ironwork and much sweeping. Liquor sprays must be taken out periodically and cleaned, and small leaks stopped. Coke must be charged to the producers, and producer fires clinkered and clinker wheeled away. Attention must be given to pumps circulating liquor to sprays, and delivering water to the tie bars and boilers.

Water softening plant must be cleaned out and regenerations effected, boiler tubes cleaned, and machinery cleaned and lubricated. All gas mains have to be examined and cleared of tar or pitch if any is found, &c.—no small task when carried out, as it is, with precision and enthusiasm.

Board of Trade Inquiry at Exmouth.

Residents' Objection to the Llandovery Site.

A Board of Trade inquiry into the application of the Exmouth Gas Company for Special Order No. 2, dealing with the proposal to acquire the Llandovery estate on Albion Hill and develop it for the manufacture and storage of gas, was conducted at the Manor Hall on April 24 by Mr. James F. Ronca, Director of Gas Administration for the Board of Trade.

Mr. S. Cope Morgan represented the Gas Company, and had the assistance of Mr. W. Doig Gibb as Consulting Engineer. Mr. W. T. Monckton, K.C. (jointly instructed by Mr. P. H. Nichols, of Exmouth, for the Convent of the Holy Family, and by Mr. E. H. Stenning, of London, on behalf of a number of other objectors, including Mr. H. A. Falkner, Headmaster of St. Peter's School), presented the case for the opposition. Mr. H. Linford Brown represented the Clinton Estate, and a number of unrepresented objectors who gave in their names included Dr. G. Adkins, former Medical Officer of Health for the County, and Mr. F. W. Hull, for Exmouth Cottage Hospital.

Details of the Order.

Mr. Cope Morgan explained that at Exmouth there were gas-works on the present site before any person present was born, and the houses sprang up around the works in the course of the last ninety years. The total capital authorized was £53,200, and out of that amount £40,468 had been paid up. The Company now asked for power to issue a further sum not exceeding £30,000, and it was proposed to arrange for a profit-sharing scheme in which the employees of the Company would be able to participate. It had become absolutely necessary to extend the works. On the present site there were erected two gasholders, one of a capacity of 100,000 c.ft., and another of 300,000 c.ft. Since 1910 the use of gas, not only for lighting, but for heating and cooking, had enormously increased. In 1914, when the works came under the management of Mr. Dean, the annual output was 70 million c.ft. of gas, and in 1929 it had increased to 144¼ million c.ft. That it was still growing was shown by the fact that the increase last year over the preceding year was at the rate of 9·6 p.ct. Therefore it must be plain that some form of extension must be given to the Company in the immediate future. He pointed out that neither for the satisfaction or safety of Exmouth was it possible to develop the output without an adequate storage of gas, and it was because of this necessity that the proposal to acquire a portion of the foreshore was put forward last year. At the inquiry a formidable objection was made by the Exmouth Urban District Council, who endeavoured to force on the Company an alternative site, at a price entirely prohibitive, and at a place a considerable distance from the works. While the decision of the Board of Trade was pending, the Llandovery site, which was the subject of the present application, came into the market. In order to meet the objections of the Council the Company decided to take an option in the purchase of the Llandovery site, which expired at midsummer. It was urgent, therefore, that the Company should have a decision before that date, and one, it was hoped, that would be favourable to the scheme. One of the advantages of choosing the Llandovery site was that it was merely an extension of what already existed. In this fresh application they had satisfied the Urban District Council who had agreed to take no action in the matter. The area of land at Llandovery was 2¾ acres, and the purchase price was £5000. On this site the Gas Company proposed to put up a most modern plant and gasholder. The site was needed primarily for storage purposes.

Mr. Cope Morgan criticized the letters of objection, pointing out that many of those written from the neighbourhood of Montpelier Road gave no indication that for years the writers had lived right on top of the gas-works. Col. Drew, who feared depreciation of his property, had stated it was almost as if he lived in the country, whereas he was only about 300 ft. from the gasholder. Miss Phear had stated the works to be surrounded by a congeries of miserable houses, and expressed alarm at the prospect of the creation of a second slum area higher up the hill, while other objectors who lived in the district described it as a pleasant residential neighbourhood. The chorus of praise which permeated the letters of objection was the highest possible tribute to the efficiency of the Gas Company's works, and it was ridiculous to say that this desirable district, which had grown up under the immediate ægis of the works, would have its whole character changed by an extension of those works.

No Complaints.

Mr. *W. E. Dean*, Managing Director of the Gas Company, said there was a great growth in the demand for gas, and not since 1910 had there been any increase in the storage capacity. It was impossible to contemplate the immediate future without some increase in storage, and there was no possibility of it on the Company's present land. It was a greater convenience to the public at large to extend a gas-works in an existing area rather than to impose it upon an entirely new area. The present works were run on the cleanest and most economic lines possible. Mr. Dean added that he was going to live at No. 1, Bicton Villas, adjoining the proposed site.

Mr. *William Doig Gibb* said the Exmouth Undertaking had a very good reputation as regarded its actual technical management, its finacial management, and the way in which its works were run. There was certainly a small amount of dust, but no nuisance. Extension of the works was absolutely necessary, the most immediate necessity being storage. There was no other site on the foreshore that was at all advantageous—it was either the rejected site or none at all. The suggested site at Llandovery appeared to him to offer certain advantages, and it was more economical, and, from the public point of view, likely to lead to less trouble, to extend an existing gas-works rather than to dump it down in a new area.

Cross-examined, Mr. Gibb said he had advised the Company to take the Mudbank brickworks site, but it was then thought impossible

to get the foreshore site. He never cared for the Halsdon Farm site, which had many objections from an engineering point of view.

Mr. Ronca: Do you consider the brickworks site as being a foreshore site?

Mr. *Gibb:* Yes; but what happened in the brickworks case, irrespective of all considerations of a gas-works, bricks went up so much in value that the price of the site became impossible. He agreed the foreshore site was the best in the interests of the Gas Undertaking and the town.

This concluded the case for the Gas Company

Opposition to the Site.

Mr. Monckton, in opening the case for the objectors, said the Llandovery site was an unsuitable one, for which the sanction of the Ministry ought not to have been asked. Although the Urban District Council was not objecting, the whole object of the inquiry was to give opportunity to anyone who had a genuine objection which they could raise effectively. The mere fact that the Urban Council did not appear did not in the least detract from the attention the Director would pay to objectors who saw not only personal disadvantage, but disadvantage to the town as a whole. Miss Phear had laid her finger on one of the most serious objections to the scheme when she suggested that it would create a slum area higher up the hill. A good deal had been made of the suggestion of a congeries of slums, coupled with the fact that it was also stated to be a good class residential area; but there were two distinct lines to be drawn in connection with property near the works. There were working class houses around the works, then rather better houses looking away from the works upon Montpelier Road, and a still better area farther up the hill, where the schools were situated, and in Albion Hill itself. Mr. Monckton dealt with individual objections, and pointed out there would be suffering, discomfort, and depreciation of property. It had been suggested that the Llandovery site could not be seen from the premises of some of the objectors; but he claimed that the buildings and plant required there would be seen by them. He added there was no doubt plant would be put there for purposes other than storage of gas, while the Company had also taken an option on the land adjoining Llandovery, and it was quite possible they intended to use it, though they could not do so without asking for further powers.

Alternative Wanted.

It was absurd to deny that the proposed extension would cause a great deal of depreciation to the business of St. Peter's School, and the value of the property on which it stood. No doubt the Company would do their best to avoid any smell and nuisance; but there was also no doubt that any parent who came down and saw a gas-works in this great field between Llandovery and the school buildings would obviously be more disinclined than he otherwise would be to send his boys to the school. Mr. Monckton pointed out the possible traffic danger as affecting the Convent School, and the fear of noise and disturbance at the Nurses' Home, while the freeholders in Albion Hill contended that the proposed extension would tend to industrial development in an area that should remain residential. With regard to the people in Montpelier Road, it was a little hard that they should be told that as they had put up with the gas-works at the back for so many years they must like it when it came to the front as well. He suggested that the works should be taken right out of the town.

Mr. Ronca commented that it had to be remembered that other sites had been considered and turned down. "To a certain extent," he added, "you are always between the devil and the deep sea. Wherever you take a site there are almost certain to be objections."

Mr. Monckton said he hoped to prove there was something obviously wrong with the Llandovery site. He fully realized that, once the Director was satisfied as to the necessity for extension, strong evidence was needed on the part of objectors; but he claimed it was not enough on the part of the promoters to suggest it was impossible to select another site to serve an area of six miles by three, except from the centre of Exmouth. It was undesirable that the source of supply should be as high as the Llandovery site, although he pointed out that, having in view the nature of the objections, it was difficult for him to suggest a definite alternative site.

Mr. *William Norris,* 13, Montpelier Road, said he had lived in the house 14 years, and had suffered a great deal of inconvenience from smells from the works, as well as smoke, while there were rumbling noises at night. He had made complaints without number to Mr. Dean, and had had to keep the back windows of the house shut, while the brasswork in the house had all gone green. Cross-examined, he said that the previous afternoon, with the wind blowing in his direction, there was no smell. In reply to the Director, witness said the smell arose when they were making some kind of manure in the works.

Mr. *J. W. Smith,* 2, Rill Terrace, said the principal nuisance was obnoxious smells, which he had noticed all the eight years he had been in the house. There was a little trouble from noise, and he had had to keep the bedroom windows closed.

The Nurses' Home.

Dr. *J. W. Hodgson,* Hon. Secretary of the District Nursing Association, said the Nurses' Home was particularly chosen with quietness in view, because the nurses needed rest after their duties. He felt the suggested scheme would interfere with that.

Mr. *C. M. P. Wright,* Vice-Chairman of the Urban District Council, said he was not representing the Council in any way. He represented the Cottage Hospital, and from that view, as well as that of the town, considered the proposed extension undesirable.

St. Peter's School.

Mr. *H. A. Falkner* said one of the attractions of St. Peter's School was the site. The existing works could be seen from the school, but if the proposed extension took place it would have a serious effect on parents intending to place their boys at the school, and it would be serious for him. He shared the view that there would be danger to children from increased traffic at the bottom of Boarden Barn. He felt there was room for the Company to extend on the present site.

Mr. Monckton said the Convent of the Holy Family wished particularly to call attention to the danger of increased traffic at that point.

Col. *Parkin,* of 1, Albion Terrace, said he objected as a freeholder on the grounds Mr. Monckton had urged. He had made one complaint to the Gas Company in 1926, with regard to the noise of a machine, and had had no trouble from that since.

Major *Muir* said he had two boys at St. Peter's School. Had he seen a big gasholder near by he would have hesitated before sending his boys to the school.

Col. *Drew,* of Stoneleigh, Bicton Villas, said he considered the proposed extension would depreciate his property.

Mr. *A. H. Ough,* M.Inst.C.E., of Dawlish, agreed that St. Peter's School would be seriously depreciated by putting a gas-works in the Llandovery site. The value of the goodwill would be depreciated as well as the value of the land. The same applied to Col. Drew's house.

Dr. *G. Adkins* said he protested from a public health point of view. He considered it a retrograde step for any permission to be given for an extension of the nuisance of the gas-works on the site indicated.

Mr. Cope Morgan submitted that the evidence of the Gas Company experts remained unchallenged. The Company was not unconscious of the type of opposition, and would endeavour, as far as possible, to retain the amenities of the neighbourhood.

The Director then closed the inquiry, and proceeded to visit the proposed site.

Gas Acts (1920 and 1929) Orders.

SPECIAL ORDERS.

Town of Dudley Gas Light Company.

To empower the Company to purchase the undertaking of the Brierley Hill District Gas Light Company, to extend the limits of supply, to authorize the use of scheduled land for gas purposes, &c.

ORDER UNDER SECTION 1.

Cambridge University and Town Gas Light Company.

To increase the amount of money which may be borrowed by the Company.

SECTION 1.

Leatherhead Gas and Lighting Company.

Authorizing the Company to borrow up to 70 p.ct., in place of one-half, of the amount of capital raised.

DECLARATIONS OF CALORIFIC VALUE.

Bolsover Gas Light and Coke Company, Ltd.—450 B.Th.U. (April 1.)

Montevideo Gas and Dry Dock Company.

At an Extraordinary General Meeting of the Montevideo Gas and Dry Dock Company, which will be held at the offices of the Company, 321, Dashwood House, Old Broad Street, London, E.C. 2, on Tuesday, May 20, 1930, the following resolutions (with or without amendment) will be submitted:

1. That the regulations contained in the printed document submitted to the meeting, and for the purpose of identification subscribed by the Chairman thereof, be and the same are hereby approved and that such regulations be and they are hereby adopted as the Articles of Association of the Company, to the exclusion of and in substitution for all the existing Articles of Association thereof.

2. That the capital of the Company be and it is hereby increased from £600,000 to £675,000 by the creation of 75,000 ordinary shares of £1 each ranking *pari passu* in all respects with the existing ordinary stock of the Company for £600,000.

3. That the sum of £75,000, part of the undivided profits standing to the credit of the reserve of the Company, be capitalized and applied in making payment in full at par for 75,000 ordinary shares of £1 each of the Company and that such 75,000 fully paid ordinary shares be converted into ordinary stock for £75,000, and that such stock be distributed among the holders of the issued ordinary stock of the Company at the closing of the books of the Company on May 7, 1930, at the rate of £1 stock for every £8 issued ordinary stock then held by them respectively, but so that no member shall be entitled to receive a fraction of £1 stock, and that the total of fractions of £1 stock which would otherwise be liable to be issued as aforesaid shall be sold by a Trustee to such persons and at such price or prices as he shall think fit and allotted as he shall direct, and the net proceeds of such sale shall be divided among the members who would otherwise be entitled to such fractions in proportion to the fractions to which they would otherwise be entitled.

Bombay Gas Company, Limited.

Ordinary General Meeting.

The Ordinary General Meeting of the Company was held at the London Offices, Moorgate Station Chambers, E.C., on Wednesday, April 23—Mr. William Graham Bradshaw, C.B.E. (the Chairman), presiding.

The Secretary (Mr. A. Dickson) read the notice convening the meeting and the report of the Auditors; and the Directors' report and the statement of accounts for the year ended Dec. 31 were taken as read.

The Chairman's Address.

The Chairman said: I think that you will agree with me, when we have examined the accounts which we present to you to-day, that they may be regarded as very satisfactory, and especially so when due allowance is made for the adverse conditions of trade which prevailed in Bombay all the year. In spite of the difficulties which have beset the Company, the result of the year's work has enabled us to write off out of revenue the whole of the suspense account which represented the balance of the cost of the new holder, £5080, the cost of a new duplicate retort charging machine, a new retort house governor, and a coke cutting and grading plant. Moreover, after providing for these out of the year's income, we have felt justified in recommending an increase of the dividend paid last year. It is true that the increase is not of very large amount, but I hope that it may prove to be a harbinger of good things to come.

The bad state of trade in Bombay was largely due to the prolonged and extensive disorganization of the textile industry. For a period of more than six months the mills were idle, and in consequence a large number of the workers left Bombay with their families to live in their native villages. This was followed by an exodus of many small traders whose means of livelihood depend on the spending power of the mill hands, with the result that trading conditions became generally depressed and unemployment among all classes was extensive.

With the intention of affording the industry time to recover from the position in which it finds itself as the result of foreign competition and labour troubles, the Government of India have introduced and passed a measure for granting protection by an increase in the revenue duty on cotton piece goods. These proposals, which are put forward as a temporary measure, will afford the necessary protection against foreign competition while the industry is engaged in carrying through a comprehensive scheme of re-organization, by which it is hoped it will be in a better position to encounter competition in the future.

In his address to the annual meeting of the Bombay Chamber of Commerce, the President, in referring to the conditions of trade of the past year and the prospects of the current year, said:

> Trading conditions have been, and remain, bad, and there are few of us who can look back on the past year or forward to the future with satisfaction. Every day we see the blame for difficult conditions of trade in India ascribed to the policy of Government, but it seems to me necessary to take a broader view and to realize that India cannot escape the effect of general world conditions. Whichever way one looks one sees over-production, and it is hard to name a world commodity to which this does not apply.
>
> In these circumstances he would be a bold man who would venture to prophesy with regard to the future; but one thing with regard to India is obvious—that is that confidence and stability are required, and no one is doing anything to better the situation, whether it is in the realm of politics or commerce or finance, by doing or saying things which impair confidence, whether it is our own confidence in ourselves or other people's confidence in us. It behoves us all to do whatever lies in our power to prevent further damage being done to India's credit.

Apart, however, from the special causes of trade depression which affected Bombay, the general trade and economic condition of India as a whole has fortunately continued satisfactory. The monsoon was good, and as a result Indian crops were fairly abundant. The imports of merchandise in 1929 were valued at £186 millions, against a similar value in 1928, and there was an import of gold and silver of £20 millions; the exports amounted to £246 millions, leaving a visible balance of trade in favour of India of £40 millions, against £42 millions in 1928.

Progress of the Company's Business.

It is gratifying to be able to report that, in spite of adverse conditions, the Company's business continued to make progress. The total quantity of gas sold was 478,765,000 c.ft., being an increase of 4,036,000 c.ft., or 0·8 p.ct., over the previous year. Although the Company meet with keen competition from electric lighting, there was an increase in the quantity of gas sold for heating purposes of 12 million c.ft., or 5·5 p.ct., but for private lighting there was a decrease of 10 million c.ft., or 25·7 p.ct.

The net total expenditure for the year on capital account is £1933. The expenditure on new mains was £888, which provided some 2 miles of additional mains. A sum of £1045 was expended in the provision of new cooking stoves. The new showroom continues its attractiveness to the public, and the expansion in the sale of gas for heating purposes has resulted to a large extent from 1331 additional cookers, geysers, and other heating appliances having been issued to consumers during the year.

Progress has also been made with the re-setting of retort beds with the object of rendering the retorts better able to resist the extra strain and wear and tear to which they are subjected since the charging and discharging machine replaced manual labour.

The Revenue Account.

Turing to the revenue account, private gas receipts are less by £488, owing to the decrease in the sale of gas for lighting purposes. The revenue from public lamps, after deducting cost of maintenance, is less by £131, but the revenue from meters, stoves, and fittings is more by £256. The revenue from the sale of residual products was less by £3603, of which coke and breeze produced less by £2669, the average price for coke sold being 25s. 7·3d. per ton, against 29s. 11·7d per ton in 1928, a reduction of 4s. 4·4d. per ton. The coke market has been difficult during most of the year owing to the importers of Bengal coke attempting to undersell. The closing down of a large iron and steel works caused a large quantity of surplus coke to be thrown on the market at a very low rate, but we were able to finish up the year with a reduced stock of 132 tons, compared with 418 tons in the previous year. The receipts from the sale of tar are less by £933, the price per gallon being 5·3d., compared with 6·5d. in 1928. In total the receipts are less by £3973.

On the other side of the revenue account the total expenditure is less by £6526. Coal, together with the cost of coke used in the water gas plant (£2366), cost £8327 less than in 1928. The quantity of coal carbonized was 1128 tons less, and the cost was diminished by slightly lower contract rates and reduction in railway freight charges. The cost of coal carbonized was 27s. 9·9d. per ton, a saving of 4s. 1·4d. per ton compared with the previous year. The quantity of coal carbonized was 29,051 tons, and the sale of gas per ton of coal carbonized amounted to 14,466 c.ft., compared with 13,654 c.ft. in 1928. The net cost of coal, after deducting receipts from residuals, was 9·4d. per 1000 c.ft., against 11·8d. in 1928. Repairs and maintenance of works and plant, which is more by £2317, includes the expenditure on additions and improvements at the works, to which allusion has already been made. Distribution charges are less by £1386, repair and renewal of meters and stoves being less by £1035, and mains and services less by £283. Rents, rates, and taxes are less by £845, and management charges are more by £411. This increase is due to income-tax on Directors' fees being charged under that head, as required by the new Companies Act, instead of being included, as previously, in rents, rates, and taxes.

Net Profit for the Year.

In the net result of the year's work the balance of profit carried to the net revenue account is £23,440 16s. 11d., which is more than the profit of the previous year by £2553. There is a profit on Exchange of £5531, which is £478 more than in 1928, owing to increased remittances. The average rate of exchange of the rupee was 1s. 5·9d., against 1s. 6·22d. in 1928. Adding this Exchange profit and deducting the debit balance of interest, £1787, and the sum of £5079 transferred from suspense account representing the balance of cost of the new gasholder, there is a net profit of £22,105 for the year.

The undivided profit brought forward from the previous year (£37,388) brings the total available profit up to £59,493. Deducting from this the interim dividend of 3½ p.ct., amounting to £10,500, paid in November last there remains £48,993, out of which a final dividend of 4 p.ct. is recommended, making 7½ p.ct. for the year. The final dividend, which is ½ p.ct. more than that for the previous year, amounts to £12,000, and leaves £36,993 to be carried forward to the current year.

It will be observed that there is a slight variation in the form in which the balance-sheet is drawn up. The alteration has been made in order to comply with the Companies Act, which came into force on Nov. 1, 1929. It is now required that there shall be stated in the balance-sheet the amount of the authorized capital, the amount of capital issued, and the total capital expenditure representing the fixed assets. The amounts due by the Company are £7333, compared with £10,433. The loan from the bank is £15,500, against £23,500 last year, a reduction of £8000.

Public Lighting.

It will be a matter of satisfaction to us all that the contract for the public lighting has been renewed on satisfactory terms for a further period of five years from March 1, 1930. The negotiations were commenced by our Engineer and Manager in Bombay, Mr. Lane, in the early part of last year, but they had not advanced very far before he was suddenly taken seriously ill and was forced by his doctor's imperative orders to return to England. It then fell to Mr. Boulter, the Assistant Engineer and Manager in Bombay, to carry on the proceedings. He had only been out for about two years, and it was a severe test of his knowledge and ability to have to handle such an important matter with so short an experience to guide him; but he did it with great tact and ability, and Mr. Lane, who I am glad to say was able to return completely cured last January in time to put the finishing touch to the contract, wrote concerning him soon after his arrival in Bombay, "I cannot speak too highly of the way Mr. Boulter has conducted the negotiations." He also stated: "I have made a thorough examination of the works and plant and am pleased to report them as being in excellent order and giving first-class results."

Mr. Lane's recovery is the subject of much satisfaction to the Directors and of great importance to the Company which he has served most devotedly and ably for nearly thirty years, during which time he has gained the confidence and esteem of those who have

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served with and under him, as well as of the Municipal Authorities and customers of the Company in Bombay. We trust that he will enjoy good health for many years to come, and may be able to serve the Company, whose prosperity he has done so much to promote, as successfully in the future as he has in the past.

Mr. Lane in his report also spoke in eulogistic terms of all the staff there, saying that "one and all of the staff have carried out their duties in a splendid manner during my absence, and I do not think any concern would wish for a more able or willing staff to serve them. Mr. Boulter has proved himself a most capable as well as a hardworking and tactful Manager and Engineer, and he has been ably supported by Mr. Gladstone." Mr. Gladstone is a young but able Engineer whom the Directors sent out to assist Mr. Boulter. Judging from results, we heartily concur in Mr. Lane's estimation of both officers. It is a cause of much gratification to the Directors that Mr. Boulter, in spite of his short experience of life in the East, should have risen to the occasion so well under very severe and difficult conditions, and that he should have been so well backed up by both the native and European staff in Bombay.

I will only add that the Directors are well pleased with the excellent and efficient manner in which the London staff, ably led by Mr. Dickson, carry out their responsible duties.

With regard to the future, in the face of the present unsettled state of the political situation throughout India and the depression of trade in Bombay it would be unwise to make any attempt to prophesy. It is hoped, however, that wise counsels will eventually prevail and that peaceful conditions will again predominate, and that they will lead to a resumption of normal conditions of trade. If this hope is fulfilled, I have no doubt that the Company will prosper in the future as well as, and even better than, it has in the past.

I now beg to move:

> "That the report of the Directors and the statement of accounts for the year ended Dec. 31, 1929, now submitted, be, and the same are hereby, received and adopted."

The Deputy-Chairman (Mr. H. H. Macleod) seconded the resolution.

Mr. P. C. Holmes Hunt said it was a pleasure to him to be present to support the motion which had been so ably put before them by the Chairman, who had presented a most lucid explanation of the Company's affairs. Recently he (Mr. Hunt) had visited India, and had spent a few days in Bombay—much of the time in the company of Mr. Lane and other officers of the Company. What the Chairman had said of Mr. Lane and the staff was thoroughly well deserved. The team work was particularly striking, and Mr. Lane's leadership was of the best. The standing which Mr. Lane had in Bombay was a great asset to the undertaking, and he hoped he would remain there for a very long time to look after the Company's affairs. Mr. Boulter, also, was a particularly able officer. The works themselves bore every sign of being efficiently managed, and they were well laid out for the requirements of the undertaking. He congratulated the Board upon the report and accounts they were able to submit.

The Chairman remarked that it was highly gratifying to have this testimony from an expert like Mr. Holmes Hunt, who had been good enough to devote some part of his holiday to an inspection of their works. They were greatly obliged to him.

The report and accounts were unanimously adopted.

An Increase of Dividend.

On the proposition of the Chairman, seconded by Mr. A. M. Paddon, M.Inst.C.E., it was agreed:

> "That a final dividend for the year ended Dec. 31, 1929, of 4 p.ct. (less income-tax at the rate of 2s. 6d. in the pound) be now declared payable on and after May 1, 1930, making, with the interim dividend of 3½ per cent., a dividend of 7½ per cent. for the year."

The retiring Directors (Mr. H. H. Macleod and Mr. A. M. Paddon) were re-elected, on the motion of the Chairman, seconded by Mr. Stanley H. Jones, M.Inst.C.E.; and the Auditors (Messrs. Spencer Gore Browne and Alfred Morland, F.C.A.) were re-appointed, on the motion of Mr. Bertram Ellis, seconded by Mr. H. F. Hills.

The Chairman proposed a vote of thanks to the Secretary, the Engineer and Manager in Bombay, the staff, and employees, both in India and in London. He said the Company were very fortunate indeed to be so well served.

Mr. Paddon, seconding, remarked that, under difficult conditions, excellent results had been achieved, and the Chairman's tribute had been thoroughly well earned.

The vote was cordially passed, and the proceedings concluded with thanks to the Chairman and Directors, on the proposition of Mr. W. J. Liberty, seconded by Mr. Clifford H. Hunt.

Metropolitan Gas Companies' Testings.

The Gas Referees' reports of the official testings for the past quarter give the following average calorific values for the gas supplied by the Metropolitan Companies named.

Commercial Gas Company.—503·2 B.Th.U. (declared calorific value, 500 B.Th.U.).

Gas Light and Coke Company.—504·1 B.Th.U. (declared calorific value, 500 B.Th.U.).

South Metropolitan Gas Company.—561 B.Th.U. (declared calorific value, 560 B.Th.U.).

South Suburban Gas Company.—512 B.Th.U. (declared calorific value, 500 B.Th.U.).

Tottenham and District Gas Company.—500·9 B.Th.U. (declared calorific value, 500 B.Th.U.).

Wandsworth, Wimbledon, and Epsom District Gas Company.—472 B.Th.U. (declared calorific value, 470 B.Th.U.).

Register of Patents.

Tar Distilling in Hydraulic Mains.—No. 303,166.

The Barrett Company, of New York (Assignees of Miller, S. P., of Tenafly).

No. 38,163; Dec. 27, 1928. Convention date, Dec. 29, 1927.

According to this invention, the gases passing from the individual retorts to the hydraulic mains are prevented from being cooled rapidly to a low temperature, and are kept at a high temperature by providing the standpipes with effective insulation, so that the gases remain at a high temperature while passing therethrough. In this way, the cooling and condensation of tar on the walls of the standpipe is greatly reduced, giving increased amounts of tar passing with the gases into the hydraulic main, and reducing the deposit of carbon or coke on the walls of the standpipe. The resulting hot gases are thus caused to enter the hydraulic or other collecting main at a high temperature, and are employed therein for the distillation of tar by bringing the tar into intimate contact therewith, thus effectively utilizing the heat of the high-temperature gases for distilling the tar, and, at the same time, enriching the gases in vapours of the oils distilled, and cleaning the gases to a greater or less degree from suspended heavy tar and pitch particles, thus giving cleaned and enriched gases from which clean or relatively clean distillate oils can be recovered by cooling and condensation.

Water is eliminated from the collecting main, or from such part of it as is employed for tar distillation, and the tar to be distilled is introduced therein and brought into intimate contact with the gases passing therethrough. In hydraulic mains having dip pipes with a liquid seal relied upon to prevent back-flow of gases from the main to the retorts, the level of tar or pitch may in many cases be maintained such as to seal these dip pipes, thus providing a tar or pitch seal instead of the usual water seal for the dip pipes. In other cases, dip pipes will not be employed, but individual pipes with valves therein will be used for shutting off the individual retorts from the collecting mains when the retorts are being discharged and charged; but the tar will nevertheless be brought into the mains, or into such part of them as may be employed for tar distillation, and atomized or brought into intimate contact with the hot gases passing therethrough, for the purpose of cleaning the gases and distilling the tar.

The distillation of the tar can advantageously be carried out in a section of the ordinary hydraulic main, which is disconnected from the remainder of the main, and which is provided with means for supplying tar thereto and withdrawing pitch, and for bringing the tar and pitch into intimate contact with the gases in the short main. Instead of using a section of the hydraulic main, or a short hydraulic main, a special distillation main or box may be provided into which the gases are introduced from the standpipes. The distillation of the tar should be carried out so as to prevent the deposit and accumulation of hard pitch.

The distillation capacity of the gas retort gases, when kept at a high temperature and employed for tar distillation, is considerably in excess of the amount of tar produced from the gases. Accordingly, in order to distil all the tar produced at the gas retort plant, it is sufficient to employ a part only of the gases for distillation; or, where all of the gases are to be employed for distillation, another source of tar is required to supply sufficient tar for utilizing the entire distilling capacity of the gases, unless the excess heat of the gases is dissipated by the use of regulated amounts of ammonia liquor or water or other cooling liquids.

Low-Temperature Carbonization.—No. 326,247.

Illingworth Carbonization Company, Ltd., of Manchester, Illingworth, S. R., of Radyr, and the South Metropolitan Gas Company and Evans, E. V., both of Old Kent Road, S.E. 15.

No. 36,443; Dec. 10, 1928.

The following claims are made for this invention:

1. Apparatus for the carbonization of coal and like material comprising a brickwork outer retort setting, a nest or nests of **H** section conductors forming carbonizing retorts, flue tubes extending around the conductors, and **L** section seatings, detachably secured to the retort setting, for supporting the conductors along their sides.

2. Apparatus as claimed in claim 1 in which the heating chamber formed by the brickwork retort setting has an upward taper.

3. Apparatus as claimed in claims 1 or 2 comprising flue tubes extending outside and/or between the carbonizing retorts in which the bottom flue is provided with an insulating member to insulate it from the sub-structure of the retort setting.

4. Apparatus as claimed in claim 3 in which the insulating member consists of a slab or slabs of semi-circular section.

5. Apparatus as claimed in any of the foregoing claims in which the flues are formed between two walls of brick, each flue being cut off by a tile extending across and built into each wall substantially as described.

Water Heaters.—No. 326,845.

Lambert, A. J., of Acton, W. 3, and White Tile Heaters, Ltd., York.

No. 37,826; Dec. 21, 1928.

When a heater is so constructed as to be of very high efficiency, state the patentees, so that the greater part of the heat is extracted from the flue gases, the moisture therein is condensed, and it is usual to provide a tray or receptacle to collect and drain off the condensate. As, however, acids and other materials are usually present in the condensate, a certain amount of fouling of the tray may take place. This is objectionable, and may in time interfere with the draining of the tray.

According to the present invention, a geyser is provided with a tray or receptacle for the condensate which is so arranged as to be readily removable for cleaning. Hitherto, it is observed, it has been customary to support the water-containing part or parts of a heater upon or in the tray which receives the condensate, but according to another feature of this invention, such parts are supported independently of the tray. The invention is also applied to water heaters of the type in which a box-like structure open on its underside to receive a burner is provided with hollow or cellular walls through which the water flows.

Gas Irons.—No. 326,964.

Cross, W., & Son, Ltd., and Kirby, J. L., both of West Bromwich.

No. 5836; Sept. 27, 1929.

The object of this invention is to provide an improved construction of iron, which ensures a supply of air being directed right down to the lower end of the burner, and which provides improved means for isolating the products of combustion from the incoming air, and also, preferably, for preventing the flame from being deflected back to the primary air inlets of the burner.

Gas Meters.—No. 326,925.

Kromschroder, F., of Osnabrück.

No. 2026; Jan. 21, 1929.

This invention is concerned with meters of the type provided with shut-off valves or pressure regulators.

Heretofore, states the patentee, gas meters fitted with pressure regulators have been defective, or have presented difficulties in their practical application, on account of the fact that the distances between their inflow and outflow connectors, or the dispositions of such connections, have differed from the standard distances or dispositions for gas meters of the same size and capacity. In existing meters, it has been proposed to provide removable connectors and coin freed mechanism connectable to the meter in place of the connectors.

According to these improvements a shut-off valve or a pressure regulator device is fitted with a connector piece, and adapted for attachment to the meter casing, as a substitute for a removable pipe connection, in such a manner that the level or the lateral disposition of the inlet and outlet connections which are standard for certain constructions and sizes of meter remain unaltered. In carrying out the invention the meter is so devised that valve devices are adapted for being mounted in place of one or other of the aforesaid connectors, the latter being usually known as side pipes. Such a valve device when so mounted presents a connection point having a location similar to that of the connector or side pipe which it replaces. Thus, the connections with the gas main or system can be made in identical fashion, whether the connector or side pipe be present or whether the substituted regulator device be present.

An advantage of this invention is that it is not necessary to provide a new meter if a gas main or system is changed over to a different pressure, for, if such change is made, all that is necessary is to substitute a regulator device in place of one of the connectors or side pipes of the existing meter.

Applications for Patents.

[Extracted from the "Official Journal" for April 16.]

Nos. 10,927—11,707.

Allen, E. A.—"Automatic gas valve." No. 10,931.
Barker, A. H.—"Cooking ranges." No. 11,421.
Barker, W.—"Coal, &c., tipplers." No. 11,116.
Broadhead, R. W.—"Machines for screening coke, coal, &c." No. 11,117.
Compagnie pour la Fabrication des Compteurs et Materiel d'Usines a Gaz.—"Multi-tariff clock train." No. 11,017.
Griggs, A. R.—See Humphreys & Glasgow, Ltd. No. 11,141.
Hawes, F. O.—"Apparatus for indicating and recording dew-point of gas." No. 11,310.
Humphreys & Glasgow, Ltd.—"Water gas apparatus." No. 10,997.
Humphreys & Glasgow, Ltd.—"Manufacture of gas." No. 11,141.
McIndoe, R. W.—"Prepayment mechanism for gas meters." No. 11,369.
Maschinenfabrik Augsburg-Nurnberg Akt.-Ges.—"Gasholders." No. 11,313.
Mengel, E. C.—See Humphreys & Glasgow, Ltd. No. 10,997.
Newton, C. B.—"Gasolders." No. 11,185.
Taunton, F. P.—See McIndoe, R. W. No. 11,369.
Tottenham and District Gas Company.—See Hawes, F. O. No. 11,310.

[Extracted from the "Official Journal" for April 24.]

Nos. 11,708—12,286.

Alder & Mackay, Ltd.—"Prepayment mechanism." No. 12,076.
Gas Light and Coke Company.—"Fluid-pressure governors." No. 11,960.
Paige, W. R.—"Gas burners." No. 12,234.

STOCK AND SHARE LIST.

[For Stock Market Report, see earlier pages.]

Issue.	Share.	When ex-Dividend.	Dividends. Prev. Hf. Yr.	Dividends. Last Hf. Yr.	NAME.	Quotations. Apl. 25.	Rise or Fall on Week.	Transactions Lowest and Highest Prices During the Week.
£			% p.a.	% p.a.				
171,978	Stk.	Feb. 6	5	5	Aldershot 5 p.c. max. C.	73—78	..	..
522,992	,,	,,	4	4	Do. 4 p.c. Pref.	70—73	..	..
1,551,868	,,	Apl. 3	7⅝	7⅝	Alliance & Dublin Ord.	92—95	..	..
374,000	,,	Jan. 9	4	4	Do. 4 p.c. Deb.	60—63	..	..
522,655	,,	Mar. 6	7	7	Barnet Ord. 7 p.c.	109—112	..	110½—111½
300,000	1	Apl. 24	1/4⅜	1/7⅛	Bombay, Ltd.	16/- -18/-*	..	17/3
174,500	10	Mar. 6	9	9	Bournemouth 5 p.c.	13½—14½	..	..
500,050	10	,,	7	7	Do. B 7 p.c.	12½—12⅝	..	..
439,160	10	,,	6	6	Do. Pref. 6 p.c.	10⅝—11¼	..	..
50,000	Stk.	Dec. 19	3	3	Do. 3 p.c. Deb.	55—58	..	..
162,025	,,	,,	4	4	Do. 4 p.c. Deb.	74—77	..	..
357,900	,,	Mar. 20	7½	7½	Brighton & Hove 6 p.c. Con.	113—116	..	114½
371,880	,,	,,	6½	6¾	Do. 5 p.c. Con.	100—103	..	..
1,287,500	,,	Feb. 20	5	5	Bristol 5 p.c. max.	87½—88¼a	..	..
855,000	,,	Apl. 3	7	8	British Ord.	110—115	..	111—112½
100,000	,,	Dec 19	7	7	Do. 7 p.c. Pref.	115—120	..	..
120,000	,,	,,	4	4	Do. 4 p.c. Red. Deb.	69—71	..	..
450 000	,,	,,	5	5	Do. 5 p.c. Red. Deb.	92—95	..	..
100,000	,,	Jan. 9	5	5	Cambridge 5 p.c. Deb.	91—94	+1	..
100,000	10	Dec. 5	8	6	Cape Town, Ltd.	8⅜—9½	..	..
100,000	10	Apl. 24	4½	4½	Do. 4½ p.c. Pref.	6½—7½*	−½	..
150,000	Stk.	Dec. 19	4½	4½	Do. 4½ p.c. Deb.	69—74	..	..
626,860	,,	Feb. 20	6	6	Cardiff Con. Ord.	96—99	..	..
237,860	,,	Jan. 9	7½	7½	Do. 7½ p.c. Red. Deb.	98—101	..	..
157,150	,,	Feb. 20	5	6½	Chester 5 p.c. Ord.	87½—92½b	..	..
98,936	1	Oct. 10	†2/-	†2/-	Colombo, Ltd. Ord.	34/—36/-	..	..
24,495	1	,,	1/1½	1/1½	Do. 7 p.c. Pref.	19/—21/-	..	..
375,402	1	Apl. 3	1/9⅜	1/9⅜	Colonial Gas Assn. Ld. Ord	20/—22/-	..	..
187,848	1	,,	1/7⅛	1/7⅛	Do. 8 p.c. Pref.	19/—21/-	..	..
2,073,280	Stk.	Feb. 20	5	7	Commercial Ord.	89—92	..	..
475,000	,,	Dec. 19	3	3	Do. 3 p.c. Deb.	57—60	..	..
787,560	,,	Feb. 20	7	7	Croydon sliding scale.	105—108	+1	105
453,100	,,	,,	5	5	Do. max. div.	83—86	..	..
542,270	,,	Mar. 6	7	10	Derby Con.	115—125e	..	..
55,000	,,	Dec. 19	4	4	Do. Deb.	67—70e	..	..
209,000	,,	Mar. 6	5	5	East Hull Ord. 5 p.c.	71—73	..	71½
1,002,180	10	Mar. 20	†4	†7	European, Ltd.	14½—15½	..	14½—15⅛
18,629,125	Stk.	Feb. 20	5⅜	5⅜	Gas Light & Coke 4 p.c. Ord.	18/9—19/3f	..	18/7½—19/-
2,600,000	,,	,,	3½	3½	Do. 3½ p.c. max.	63—65	..	63¾—64½
4,157,020	,,	,,	4	4	Do. 4 p.c. Con. Pref.	77—80	..	77⅛—78¼
5,602,620	,,	Dec. 19	3	3	Do. 3 p.c. Con. Deb.	58—61	..	59½—61
3,642,770	,,	,,	5	5	Do. 5 p.c. Red. Deb.	98—101	..	99½—100½
82,500	,,	Mar. 20	7	7	Hastings & St. L. 5 p.c. Conv.	96—101	..	..
258,740	,,	,,	5½	5½	Do. 3½ p.c. Conv.	78—83	..	79
70,000	10	Oct. 10	†10	†10	Hongkong & China, Ltd.	13⅞—14⅞	..	..
213,200	Stk.	Mar. 6	6	6	Hornsey Con. 3½ p.c.	90—93	..	..
1,976,000	,,	Nov. 1	20	10	Imperial Continental Cap.	400—420	+10	397—418
223,130	,,	Feb. 6	3½	3½	Do. 3½ p.c. Red. Deb.	75—85	..	..
235,242	,,	Mar. 20	8½	8½	Lea Bridge 5 p.c. Ord.	112—115	..	..
2,145,907	,,	Feb. 20	6	6	Liverpool 5 p.c. Ord.	90½—91½b	−½	..
600,000	,,	Mar. 20	7	7	Do. 7 p.c. Red. Pref.	100—102b	..	..
165,736	,,	Feb. 20	9	8	Maidstone 5 p.c. Cap.	119—124	..	..
63,480	,,	Dec. 19	3	3	Do. 3 p.c. Deb.	52—55	..	..
75,000	5	Dec. 5	†10	†10	Malta & Mediterranean Metrop'itan (of Melbourne)	5½—6	..	..
392,000	—	Apl. 1	5½	5½	5½ p.c. Red. Deb.	90—93	..	..
541,920	Stk.	Nov. 21	†9	†6	Montevideo, Ltd.	107—112	..	..
2,061,315	,,	Feb. 20	5	5½	Newcastle & Gateshead Con.	15/9—16/3d†	+-/1½	..
682,856	,,	,,	4	4	Do. 4 p.c. Pref.	70—71d	..	..
691,705	,,	Dec. 19	3½	3½	Do. 3½ p.c. Deb.	66¾—67½d	..	..
169,940	,,	Mar. 6	7½	7½	North Middlesex 6 p.c. Con.	109—114	..	..
396,160	,,	Feb. 6	5	5	Northampton 5 p.c. max.	74—77	..	..
300,000	,,	Apl. 24	9	7	Oriental, Ltd.	106—111*	−2	..
60,000	5	13 My., '15	—	—	Ottoman	0—½	..	..
205,162	Stk.	Jan. 9	8	8	Plym'th & Stonehouse 5 p.c.	107—110	..	..
424,416	,,	Feb. 20	8	8	Portsm'th Con. Stk. 4 p.c. Std	110—115	..	..
241,446	,,	,,	5	5	Do. 5 p.c. max.	78—81	..	79½
2,999,464	1	June 27	—	†5	Primitiva Ord.	28/—30/-	..	..
186,000	100	Dec. 2	4	4	Do. 4 p.c. Red. Deb.	92—95	..	..
677,837	Stk.	Jan. 23	4	4	Do. 4 p.c. Red. Deb. 1911	81—84	..	..
371,496	,,	Dec. 19	4	4	Do. 4 p.c. Cons. Deb.	81—84	..	82
150,000	10	Apl. 3	6	6	San Paulo 6 p.c. Pref.	8½—9	..	..
1,736,968	Stk.	Mar. 20	6½	6½	Sheffield Cons.	102—104e	..	..
95,000	,,	Jan. 9	4	4	Do. 4 p.c. Deb.	76—78e	..	..
90,000	10	June 13	‡4	‡4	South African	4—6	..	..
5,709,895	Stk.	Feb. 20	5	7½	South Met. Ord.	101—103	+½	101¾—103
500,000	,,	,,	6	6	Do. 6 p.c. Irred. Pf.	107—110	..	109½
1,895,445	,,	Jan. 9	3	3	Do. 3 p.c. Deb.	58—61	..	61
734,000	,,	Mar. 6	6½	6½	Do. 6½ p.c. Red. Db.	99—101	..	99½
91,500	,,	Mar. 20	8½	8½	South Shields Con.	105½—107¾d	..	..
1,543,795	,,	Feb. 20	6½	6½	South Suburban Ord. 5 p.c.	100—103	..	100½—102
468,827	,,	Dec. 19	5	5	Do. 5 p.c. Deb.	92—95	..	..
647,740	,,	Feb. 20	5	5	Southampton Ord. 5 p.c. max.	76—79	..	79
121,275	,,	Dec. 19	4	4	Do. 4 p.c. Deb.	72—75	..	..
179,014	,,	Feb. 20	8	8	Sutton Ord.	113—116	..	..
67,828	,,	Jan. 9	5	5	Do. 5 p.c. Deb.	91—94	..	..
250,000	,,	Mar. 6	7	7	Swansea 7 p.c. Red. Pref.	98—100	..	..
200,000	,,	Dec. 19	6½	6½	Do. 6½ p.c. Red. Deb.	99—101	..	..
1,076,490	,,	Mar. 6	6⅝	6⅝	Tottenham District Ord.	101—105	..	103½—104
150,000	,,	,,	5½	5½	Do. 5½ p.c. Pref.	95—98	..	..
199,005	,,	Dec. 5	4	4	Do. 4 p.c. Deb.	73—76	..	74½
182,380	10	30 Dec., '12	—	—	Tuscan, Ltd.	3½—4¾	..	..
85,701	Stk.	Mar. 20	6	6	Do. 6 p.c. Red. Deb.	75—80	..	..
309,094	,,	Mar. 6	7	7	Uxbridge, Maidenhead, & Wycombe 5 p.c.	94—99	..	..
88,336	,,	,,	5	5	Do. 5 p.c. pref.	85—90	..	..
1,180,970	,,	—	—	—	Wandsworth, Wimbledon, and Epsom Cons.	108—113	..	..
200,000	,,	Feb. 20	5	5	Do. 5 p.c. Pref.	85—90	..	..
488,344	,,	Dec. 19	5	5	Do. 5 p.c. Deb.	92—97	..	..

Quotations at:—*a.*—Bristol. *b.*—Liverpool. *c.*—Nottingham. *d.*—Newcastle. *e.*—Sheffield. *f.*—The quotation is per £1 of Stock. *Ex. div. †Paid free of income-tax. ‡For year.

STOCK ISSUES.

By Order of the Directors.

THE BOGNOR GAS AND ELECTRICITY COMPANY.

Messrs. A. & W. RICHARDS

are Instructed to OFFER FOR SALE BY TENDER

£14,000

NEW CONSOLIDATED STOCK,

ranking for a Maximum Dividend of 7 per cent. equally with existing similar Stock now receiving this rate.

Minimum Price of Issue, £102 per £100.

Yielding at that Price, £6 17s. 3d. per cent. Also

£11,000

5½ PER CENT. REDEEMABLE DEBENTURE STOCK.

Minimum Price of Issue, Par,

to be redeemed at Par on the 1st of January, 1940.

Prospectus and Forms of Tender (which latter must be sent in by 11 o'clock on Tuesday, 6th May) may be obtained of Messrs. A. & W. RICHARDS, 37, WALBROOK, E.C. 4.

By Order of the Directors.

THE GOSPORT DISTRICT GAS COMPANY.

Messrs. A. & W. RICHARDS

are Instructed to OFFER FOR SALE BY TENDER

£10,000

CONSOLIDATED ORDINARY STOCK,

ranking for a Standard Dividend of 6 per cent. equally with existing similar Stock now receiving £7 7s. 9d. per cent.

Minimum Price of Issue, £105 per £100.

Yielding at that Price, £7 0s. 8d. per cent. Also

£3800

SIX PER CENT. REDEEMABLE DEBENTURE STOCK.

Minimum Price of Issue, Par,

To be redeemed at Par on the 1st January, 1940.

Prospectus and Form of Tender (which latter must be sent in by 11 o'clock on Tuesday, the 13th of May) may be obtained of A. & W. RICHARDS, 37, WALBROOK, E.C. 4.

SUTTON GAS COMPANY.

ISSUE OF £26,672 5 PER CENT. PERPETUAL DEBENTURE STOCK AT £98 PER £100 STOCK.

(Ranking *pari passu* with existing 5 Per Cent. Perpetual Debenture Stock on which interest is payable half-yearly on 1st January and 1st July.)

Payable on Application . .	10 per cent.
Allotment . .	30 ,,
31st May . . .	30 ,,
30th June . . .	28 ,,
	98 per cent.

The Directors are prepared to receive Applications for the above Stock upon the Terms of the Prospectus dated 30th April, 1930, copies of which are obtainable from the undersigned.

Applications, on the Forms provided, must reach the Company's offices not later than 14th May, 1930.

By Order of the Board,
CLEMENT STREDWICK,
Secretary.

299, High Street,
Sutton, Surrey,
April 30, 1930.

The Electrical Fusion of Gas Pipes

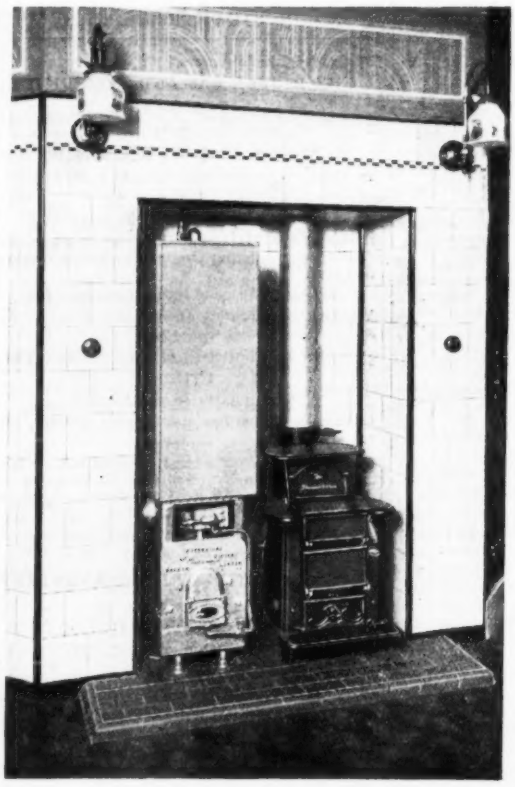
— BY —

H. C. WIDLAKE, A.M.I.E.E.,
Chartered Electrical Engineer, of the Plymouth & Stonehouse Gas Light & Coke Company.

An Illustrated Booklet, in stiff paper cover, measuring 8 ins. by 4 ins. Invaluable for circulation among all workers in the Distribution Departments of Gas and Electricity Undertakings.

Single Copies, 6d. (post free); 12 copies, 5/-; 50 copies, 20/-; 100 copies, 35/- (postage extra). Special rates for larger quantities.

WALTER KING, LTD., "GAS JOURNAL" OFFICES, 11, Bolt Court, Fleet Street, E.C. 4



Constant Hot Water Supply with "VICTOR" GAS BOILERS and COKE BOILERS

We reproduce an item of our Stand at the recent "IDEAL HOME" Exhibition, showing a "Domestikatum" Coke Boiler fitted in conjunction with a No. 921 LJ "VICTOR" Complete Apparatus for winter and summer use respectively. The Gas-Heated Set is fitted with the new adjustable Thermostat and Luminous Burner giving variable bye-pass consumption to work constantly with the minimum amount of gas, while the storage is insulated to conserve the heat from both the coke as well as the gas unit.

"VICTOR" Complete Sets are also made with cylindrical storage to stand pressure up to 100 ft. head water, and are suitable for the highest buildings.

We solicit your enquiries, and will gladly send price lists upon request.

THOMAS POTTERTON (Heating Engineers) LTD.

Cavendish Works, Ravenswood Road, BALHAM, London, S.W. 12

TELEPHONE: STREATHAM 2052/3.
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THE WILLEY METER IS THE *RELIABLE* METER.

It never "Lets you down."

WILLEY'S MAIN COCKS AND GAS FITTINGS are fitted with patent stop washers instead of pins which prevent accidental turning on of Gas consequent upon defective pins, and also retain the full bearing surface of the barrel.

THEY ARE THE BEST IN THE TRADE.

Use Willey products and your Maintenance Costs fall proportionately.

We know our business from "Works to Cookers."

WILLEY & Co LTD

Makers of Everything for Gas

CHIEF OFFICES AND WORKS - - - - - ST. THOMAS, EXETER.
'Phone: 4064-5. 'Grams: "Willey, Exeter."

LONDON OFFICES AND WORKS - - - - - 89, Hertford Rd., Kingsland, N. 1
'Phone: Clissold 0224. 'Grams: "Gasvillado Kinland, London."

MANCHESTER METER WORKS - - - - - Saville Street, Oxford Road.
'Phone: City 7419. 'Grams: "Wilmeter, Manchester,"

LEICESTER METER WORKS - - - - - - Rowsley Street.
'Phone: 24177. 'Grams: "Meters, Leicester.'

DARLINGTON METER WORKS - - - - - - Valley Street
'Phone: 2586. 'Grams: "Willey, Darlington."

NEWPORT, MON., DEPOT - - - - - - - Mill Street Station.

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Orders to Alter or Stop PERMANENT ADVERTISEMENTS should be received by the FIRST POST on Monday.

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Telegrams: "GASKING, FLEET LONDON." Telephone: Central 6055.

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— ESTABLISHED 1873 —

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Gas Purification Contractors

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Oxide of Iron

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Spent Oxide

Per Contra or Separately.
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FOR producing Long Needle-like CRYSTALS: also plant for producing NEUTRALIZED SULPHATE.

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Telephone: VICTORIA 2417. Telegrams: "EVAPORATOR PHONE LONDON."

GAS WORKS STEAM PLANT. We can meet your requirements for BOILERS, RECEIVERS, TANKS, WASHER TUBES, SIZING SCREENS, PLATE WORK, BOILER SETTINGS, CHIMNEYS (brick and steel).

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H. & T. DANKS (NETHERTON) Ltd., NETHERTON, DUDLEY.
(See illustrated page advert., March 26, Centre p. IX.)

GEORGE WILSON GAS METERS, Ltd.
for
GAS-METERS, ORDINARIES, SLOTS, AND REPAIRS

Foleshill Road, COVENTRY.
Telephone: 596. Telegrams: "GASMETER."
Certus Works, Kingston Road, Raynes Park, LONDON, S.W. 20.
Radium Works, 12, Radium Street, Oldham Road, MANCHESTER.

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SPECIALLY prepared for the manufacture of SULPHATE OF AMMONIA.

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THE BRITISH GAS PURIFYING MATERIALS CO., LTD.,
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FOR Motor Lorries and Railway Traffic can be seen erected at our Works READY FOR DELIVERY. Inspection by your Engineer invited and a test by your Local Inspector of Weights and Measures before delivery. Every machine a High-Class Engineering Product and fully guaranteed.

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MANUFACTURERS OF
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"FALCON" INVERTED LAMPS,
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SUPERHEATER BURNERS, and
CONVERSION SETS for Street Lanterns.

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JOHN RILEY & SONS, Limited, Chemical Manufacturers, Accrington, Lancs., P.B.O. Box No. 62, are MAKERS of Special SULPHURIC ACID ("Eagle" Brand), for Sulphate of Ammonia Making. Highest percentage of Sulphate of Ammonia obtained from the use of this Vitriol, which has now been used for upwards of 80 years. Reference given to Gas Companies.

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EXPERIENCED Lecturer and Demonstrator in Cooking by Gas can give LOCAL DEMONSTRATIONS for Gas Undertakings.
Gas Engineers should apply now for vacant dates to Miss H. H. TUXFORD, M.C.A., "WESTWOOD," TATTERSHALL, LINCOLN.

APPOINTMENTS, &c., VACANT.

THE Sunderland Gas Company invite Applications for the Position of SECRETARY. Candidates must have been well educated, and have had considerable Secretarial and Accountancy experience in a Gas Undertaking. Age 35 to 45 years. Commencing Salary, not less than £800 per Annum.
Applications, endorsed "Secretary," stating Age, present Position, Experience, and Qualifications, with *copies* of Testimonials, to be submitted not later than 7th May, 1930, to the CHAIRMAN, SUNDERLAND GAS COMPANY, FAWCETT STREET, SUNDERLAND.

WANTED for Gas Engineer's Office, well educated, refined, and thoroughly qualified Lady SHORTHAND TYPIST. Previous Experience office routine desirable.
Apply, stating Age, where Educated, Qualifications, and Wages required, to No. 8063, "GAS JOURNAL," 11, BOLT COURT, FLEET STREET, E.C. 4.

WANTED for a British Colonial Gas Undertaking a Gentleman as ENGINEER and MANAGER, aged about 30 to 35. Must be a hard worker, of Practical Experience, and Keen to Extend Business.
Salary, £1000 per Annum, with House allowance and Bonus, free Passages Out and Home.
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Purifiers.—Dry Lute Type. Two Sets of Four, 10 ft. square; with Lifting Gear, Valves, &c.
Meters.—Two Rectangular Station Meters fitted with New Drums, 15,000 c.ft. per hour capacity.
Cylindrical Station Meters, 10,000, 4000, 3600, and 2000 c.ft. capacities and smaller.
Station Governors.—Parkinson, Cowan, Braddocks, and Peebles, 4 in., 6 in., 8 in., 9 in.
Retort Ironworks for beds of 4's, 5's, 6's, 7's, and 8's. 22 in. by 16 in. Self-Sealing Mouthpieces. 6 in. Ascension Pipes and all to follow.
Washers and Tar Extractors—Livesey and Cripps type. 2 million, 500,000, 400,000, 250,000, 200,000, and 150,000 c.ft. per day.
Exhausting Sets.—Steam and Gas Engine-driven, 5000 to 40,000 c.ft. per hour capacity.
Storage Tanks.—Large number in Stock (Rectangular and Cylindrical). TAR Stills, &c.
Tar and Liquor Pumps, Steam and Belt-Driven, Air Receivers, Fans, Blowers, Valves, Riveted Tubes.
Firth Blakeley, Sons, & Co., Ltd.
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Apply to the OXFORD GASLIGHT AND COKE COMPANY.

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COUNTY BOROUGH OF SOUTHPORT.

TENDERS FOR THREE-MILLION CUBIC FEET GASHOLDER.

THE Gas Committee invite Tenders for the Erection complete of a three-million cubic feet capacity WATERLESS GASHOLDER, which at some future date can be increased to a capacity of Four-Million Cubic Feet. The Gasholder to include all Auxiliary Plant, Connections, and Attachments for the working of the same; also of Work to be done and Material to be used in the Construction of FOUNDATIONS for the Gasholder.
Persons desirous of tendering are requested to make written application to the Engineer and Manager, Gas-Works, Crowlands, Southport, for the Specification of the Work in connection with the Gasholder and Foundations before tendering.
Sealed Tenders to be forwarded to the undersigned not later than Monday, the 5th May, 1930 endorsed "Gasholder."

J. ERNEST JARRATT, Town Clerk.

Town Hall,
Southport,
April 16, 1930.

BOROUGH OF WALLINGFORD, BERKS.

THE Corporation invite Tenders for the Supply and Erection of a TWO-LIFT SPIRALLY-GUIDED GASHOLDER, capacity 100,000 cubic feet, and STEEL TANK, and REINFORCED CONCRETE FOUNDATIONS.
Copies of Specification and Drawings, and Form of Tender, will be forwarded on application to the undersigned, and such application must be accompanied by Three Guineas, which will be returned on receipt of a *bona fide* Tender.
Tenders, on prescribed Forms, sealed and endorsed "Tender for Gasholder and Tank," must be received at my Office not later than Wednesday, the 21st of May, 1930.
The Corporation do not bind themselves to accept the lowest or any Tender.

FRANCIS R. HEDGES, Town Clerk.

Town Clerk's Office,
Wallingford, Berks,
April 25, 1930.

SUTTON-IN-ASHFIELD URBAN DISTRICT COUNCIL.

THE Gas and Water Departments of the above Council are prepared to receive TENDERS for the Supply and Delivery of the following Goods:

British PUDDLED IRON TUBES and FITTINGS (Steam), I.G.E. Specification.
ENGINE and CYLINDER OIL,

spread over a period of Twelve Months.
Tender Forms can be obtained on application to the Gas and Water Manager, Mr. J. J. Merrell, Council Offices, Station Road, Sutton-in-Ashfield.
Tenders, endorsed "Materials," to be sent so as to reach me not later than Monday, the 19th day of May, 1930.

By order,
LUTHER PEPPER, Clerk to the Council.

Portland Square,
Sutton-in-Ashfield, Notts.,
April 26, 1930.

The Electrical Fusion of Gas Pipes.

By H. C. WIDLAKE, A.M.I.E.E.,

Chartered Electrical Engineer, of the Plymouth and Stonehouse Gas Light and Coke Company.

An Illustrated Booklet, in stiff paper cover, measuring 8 ins. by 4 ins. Invaluable for circulation among all workers in the Distribution Departments of Gas and Electricity Undertakings.

Single Copies 6d. (post free); 12 copies, 5/-; 50 copies, 20/-; 100 copies, 35/- (postage extra). Special rates for larger quantities.

WALTER KING, LTD., "GAS JOURNAL" OFFICES, 11, Bolt Court, Fleet Street, London, E.C.4.

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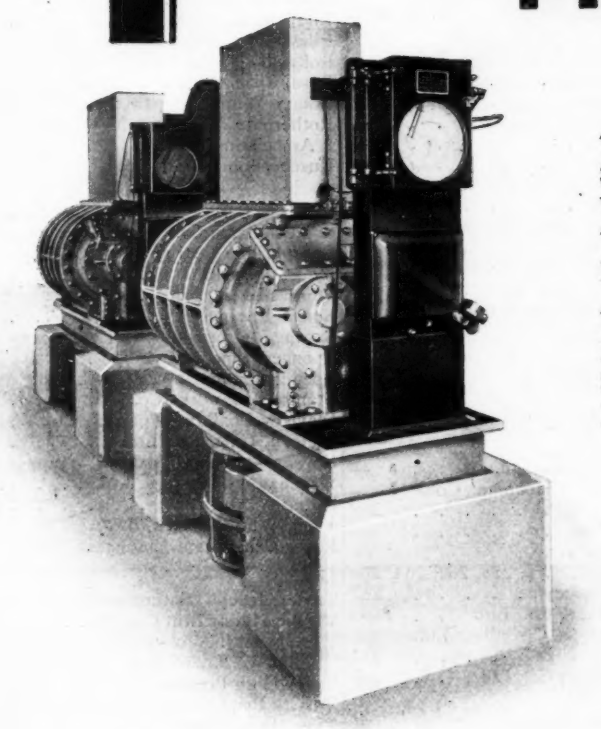

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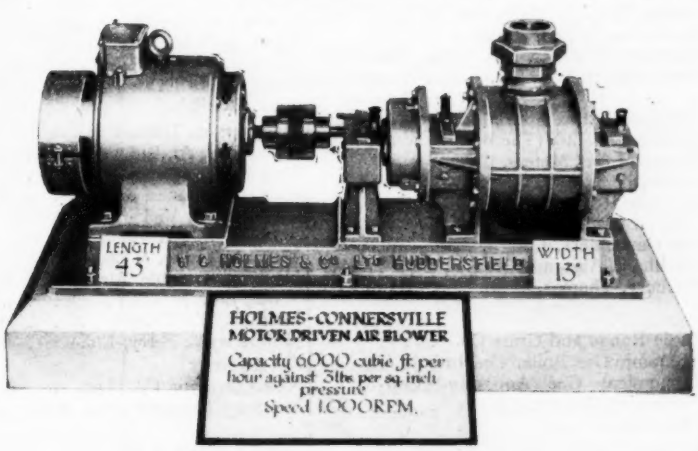
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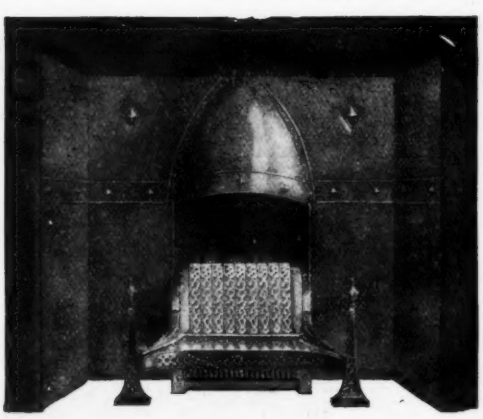

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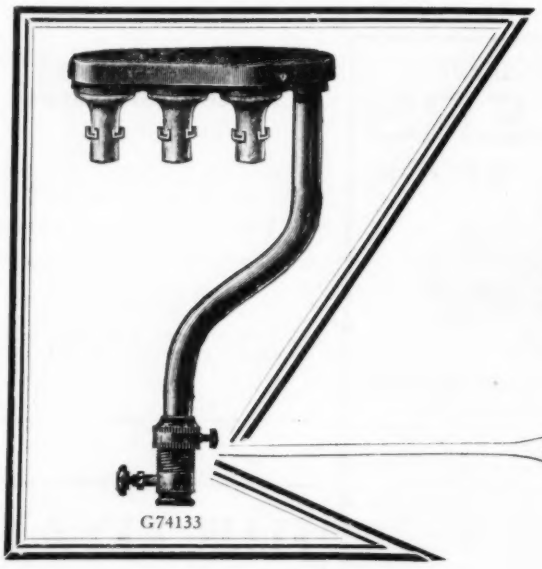

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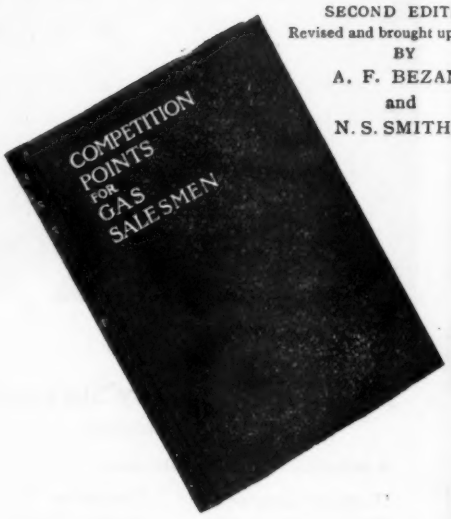

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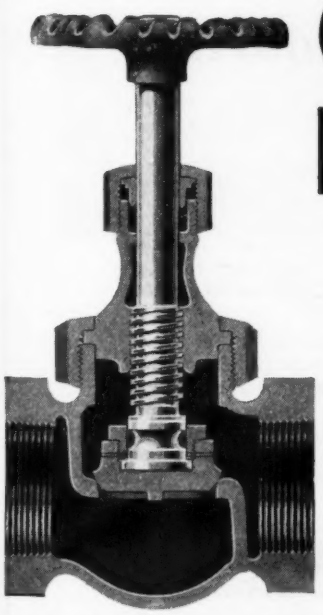

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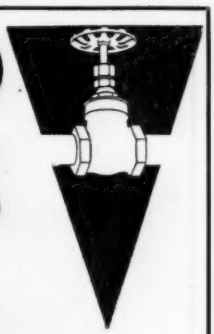

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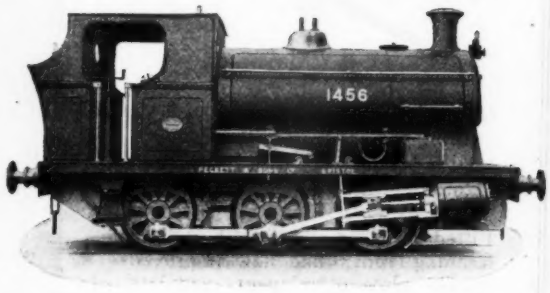

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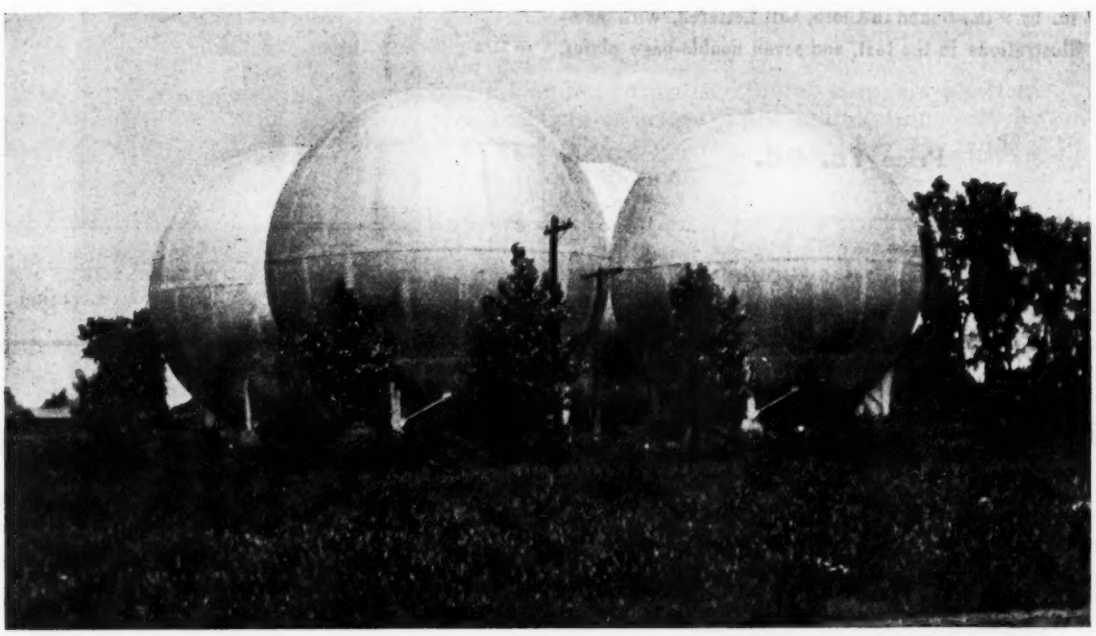

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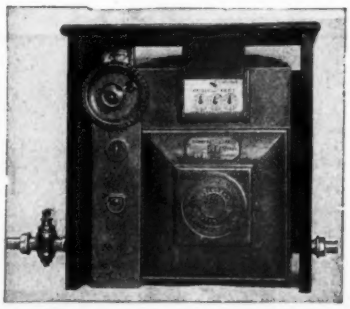

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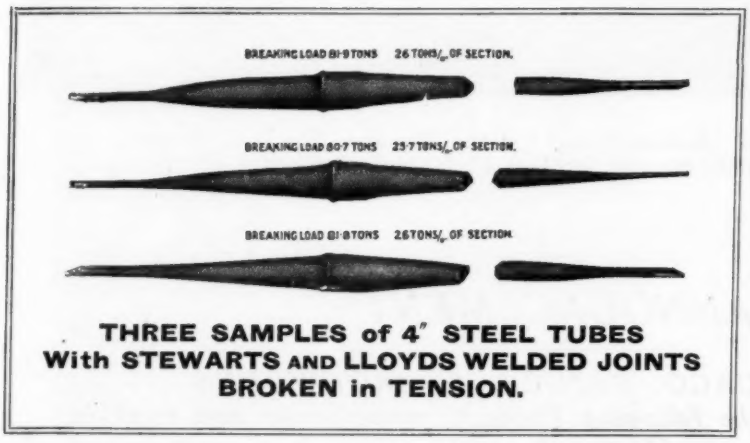
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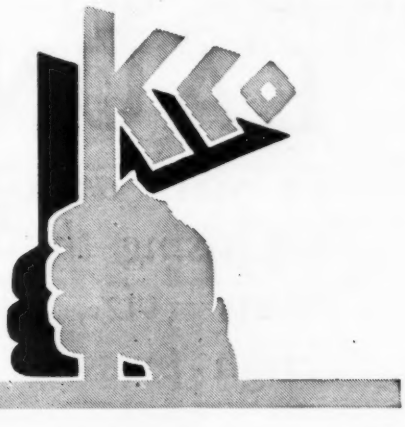

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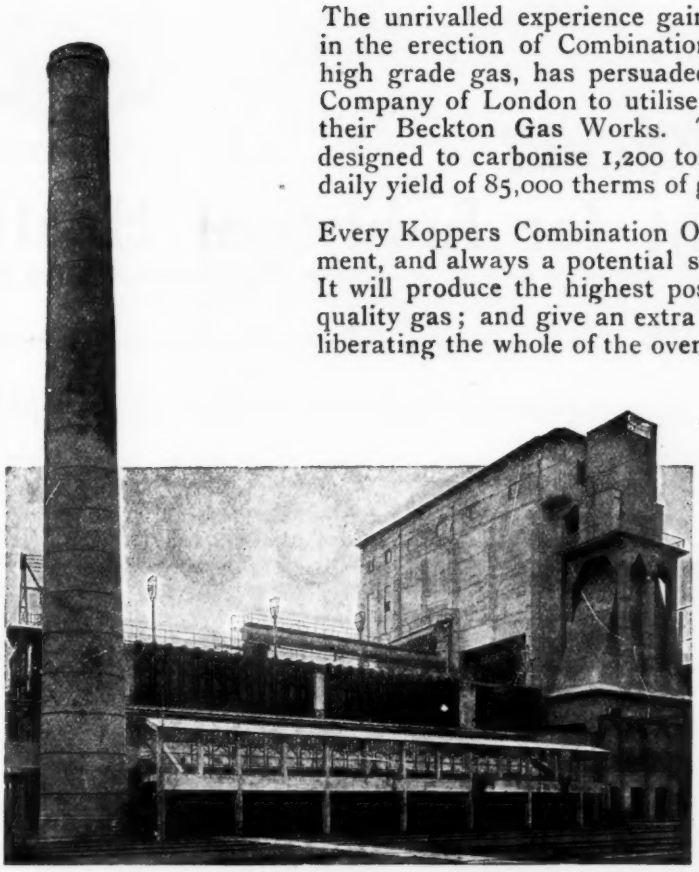

ILLUSTRATION:
Koppers Combination Oven Plant at Düsseldorf Gas Works, carbonising 400 tons of coal per day.

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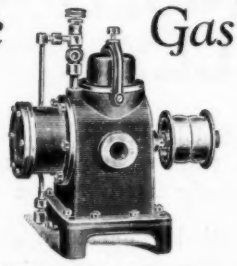

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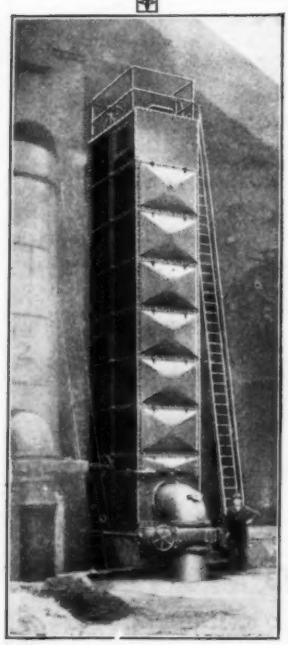

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